The United States MILLER

Published by E. HARRISON CAWKER. { Vol. 16, No. 3. } MILWAUKEE, JANUARY, 1884. { Terms: $1.00 a Year in Advance. Single Copies, 10 Cents.

POOLE & HUNT'S LEFFEL TURBINE WATER WHEEL.

We have been favored by Messrs. Poole & Hunt, of Baltimore, Md., the well-known manufacturers of water wheels and other milling machinery, with cuts, illustrating their wheels in actual use. We take pleasure in making extracts from their recent catalogue. In regard to the head-race they say, "a very frequent error is committed in failing to give it sufficient capacity. It should be made both wide and *deep;* and this is especially necessary when the race is of considerable length and a large quantity of water is to pass through it. It is difficult to give a definite rule which will apply to every case; but it may be stated as a general rule that the water should not flow faster than 100 feet per minute: In cases where there is a long race, after the water has been running three or four hours, the head frequently draws down from one to three feet. The effect of this is precisely the same as if the dam had been lowered an equal distance—resulting in a loss of power which would have been prevented by making the race as wide and deep as it should be.

The *wheel-pit* must next be located; and we cannot too strongly impress the importance of a proper *depth of pit.* This is a point in which mill-owners and millwrights, in putting in our wheel are more liable to err than in any other.*** Whether under high or low head, the pit should be made deep and wide. There is no case where this is more important than where a large wheel is run under a low head, as under these circumstances no loss of head, however small, can be afforded. A pit of insufficient size causes the water to re-act upon the wheel; and an additional loss of power is also caused by the fact that a portion of the head is consumed in forcing the water out of the pit when there is not sufficient outlet. As a general rule, the depth of the pit should not be less than thirty inches for the smallest wheels, and in some cases as much as six or eight feet for the largest wheels under high heads. An average size wheel, say a 48-inch, under an average head, say 12 feet, should have 80 inches clear space from the mouth of the cylinder or wheel tube, where the water discharges from the wheel, to the bottom of the pit."

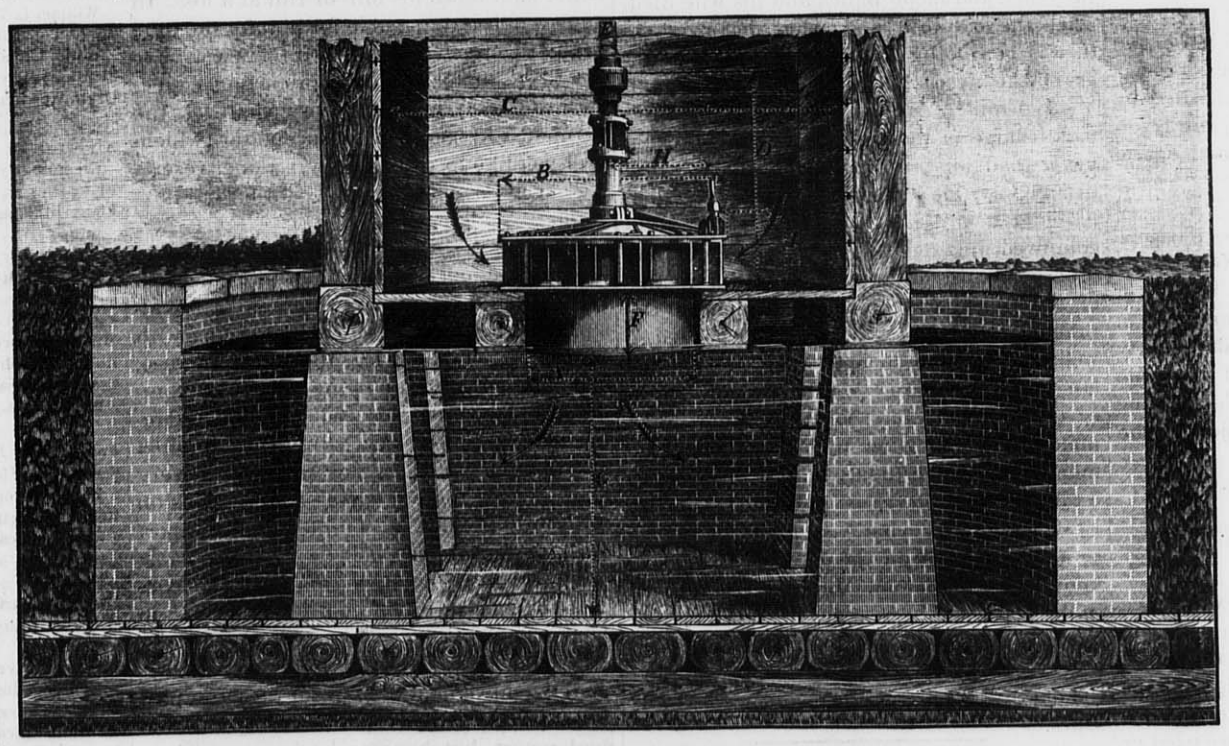

FIG. 1.—A POOLE & HUNT LEFFEL TURBINE WATER WHEEL AS IT SHOULD BE SET.

Fig. 1 shows a Poole & Hunt Leffel turbine wheel, properly set.

Fig. 2 shows a plan for driving a small flouring mill of two run of stones by a small Leffel wheel under a head, say, of 25 to 30 feet or more. The wheel is contained in an iron globe case and has a short draft tube. The power is taken off by belting; one belt for each pair of burrs, and a separate belt for the vertical shaft that drives the elevators, conveyers and other machinery.

Many persons experience much trouble and annoyance from using pulleys of small diameters and wide belts. The better plan is to have the pulleys of large diameters and the belts narrow.

Our practice is, to make the pulley on the spindle of the stones, the same diameter as the stone it drives. In such a case a belt six or seven inches wide is sufficient for ordinary country work. In the illustrations a corner of the mill house is removed, in order that the arrangement of the machinery within may be seen.

Fig. 3 illustrates the vertical and horizontal parts of a large flume and casing of combined plate and cast iron, containing four turbines on two horizontal shafts. These wheels drive a large pulp mill in Vermont, and develop about 1000 horse power.

[For THE UNITED STATES MILLER.]

ENGLAND AND FREE TRADE—FIVE HUNDRED YEARS OF HIGH PROTECTION.

By JOHN W. HINTON of Milwaukee.

In reply to several correspondents, seeking information as to how England first became a free trade country (which in fact she is not), we append the following extract from a lecture delivered before the Brooklyn Revenue Reform Club, by Robert Ellis Thompson Ph. D. It contains the most searching historical truths—like its author it is a most able exponent of the facts which the free traders never like to listen to, and which they are always careful never to utter or to publish. We advise the readers of the UNITED STATES MILLER to cut it out and keep it.

"I will take the history of the English industry to show how this power may be acquired, and I will take the history of two of her dependencies to show how it may be exercised. Some have a notion that the industrial history of England began in June, 1847, when the corn laws were repealed. But a great many things happened in England before that. The industrial history of England began away back in the middle ages, when her characteristics were 'barbarism, bad Latin, and free trade.' England was in those days, a poor backward country. Although the Romans had built furnaces in the Forest of Dean, she was dependent on Normandy for the little supply of iron she had. Prof. Thorold Rogers tells us, in the natural course of things, all the wool was exported to Flanders to be spun, woven and fulled. The whole population of England was engaged in raising food, and yet they raised in all England what we should think, food enough for a million and a half of people, when there were two million and a half of people in the island. But we know how this ended. It ended when Edward III, the greatest of the Plantagenets, in 1337 made up his mind that instead of importing Flemish woolens he would import Flemish workmen, and he went about it in what protectionists would think a rather heroic fashion. He simply forbade the export of English wool, and forbade the import of Flemish woolens, and as the Flemings could not do any better they were obliged to emigrate to England. Those of you who are given to novel reading will remember the part taken by the Flemish colonists in the defence of the castle in Sir Walter Scott's romance, the 'Betrothed.' Now remember for five hundred and ten years from the passage of that law, England was a protectionist country, one after another of her industries was taken under her protection; and the most vigorous, the most successful, and the most popular of her rulers were precisely those most active in this direction. Elizabeth took advantage of troubles which drove emigrants from the Continent to increase the manufacture of laces. Cromwell laid the foundation of England's mercantile marine by laws which remained in force till 1850. The Stuarts protected iron. The Georges gave their attention to cotton and iron. Cotton has the most remarkable history of all. You know that the cotton manufacture has indentified itself and England with the doctrine of free trade. Without protection there never would have been a cotton manufacturer in England. When England began to manufacture cottons for herself, she had not a single advantage in the manufacture. India was able to undersell her in every sort of this fabric; but England laid an absolute prohibition upon the importation of East India cottons which lasted till 1819. Every advantage was on the side of India; it had cheap labor, it had skill in the production, it had the material at hand. England had none of these things, yet England determined to make her own cottons. Times were dull in the North of England.

The northern English shires, which are so important now as manufacturing centers were backward; they were places simply noted for their devotion to the Pope and the Pretender. But mark what followed the purpose to introduce that industry. The first result was a great series of inventions in the cotton manufacture, and which enabled England immediately to out-strip every competitor; just as was the case under the Continental system of Napoleon, when the first great application of chemistry to manufacturing began. In those days, one invention followed another, the power-loom, the spinning, the spinning mule, and, greatest of all, James Watt's steam engine, which displaces human muscle by energies mightier than they. Then, in connection with that, the invention of the factory system which enabled the organization of industry with all the thoroughness and completeness of an army; every man standing in his place and doing his one fragment of work with the whole concentration of his attention. And it was in the hey-day of these inventions that England formed that ambition which Adam Smith so justly rebuked in her of making herself the world's work-shop, of securing to herself the manufacture of those great inventions and the industries based on them. English law, continued until well into the present century, forbade the export of a single piece of English machinery, and when the first models of English machines were made for export to America, the Government seized those models and destroyed them. English laws, again, forbade the export of English work-men. It was a penal offense to tempt any skilled workman to leave His Majesty's dominions; and these laws,—at least the former of them—are defended by Mr. McCullough of Edinburg in his Dictionary of Political Economy. The seventy years which preceded the repeal of the corn laws in England, were years of marvelous industrial development, without a parallel; a development carried on under the aegis of protection,—a protection extended to every English industry, that is now competing for the markets of the world;—a protection supported by restrictions on the colonies and for a long time on Ireland, which had the simple purpose of making them a market for English goods,—supported by the diplomatic influence of the most powerful military and naval people in the world. When England had secured this position and aggrandizement, then and not till then were the restrictions removed and England invited the world to follow her into the career of free-trade."

In our next we will give some facts to show that England to-day is more highly protected in some ways than the United States.

TRADES-UNION TENDENCIES.

One of the most serious indications in the organization and management of some of the more outspoken of the trades-union formations of the present day is the readiness with which they forget that it is easy to object, to obstruct, and even to destroy. To restore, to build up, to perfect again, this requires time, patience, and, almost above all other things, profound peace, and to these things the union leaders do not always turn their attention. If they do with any real appreciation of the facts involved, they show themselves hopelessly ignorant of the cleares teaching of experience, in that they expect any good result to be wrought by the kind of agitation which some of their leaders insist that they are called upon to promote. They forget the lessons taught by the common fact that an infant can throw a bit of steel into the teeth of massive gearing which will smash and disable them in an instant, and that a speck of dust so small as to be but barely visible can cause distress and injury to an eye which may prove beyond remedy. To repair the broken machinery requires time and costly, patient endeavor on the part of some one, and to search out the source of the injury and to provide for the healing of an eye, calls for skill and often for self-denial beyond any one's thought.

The damage to property or to established lines of business, even in an indirect way as by the action of strikes by the men who, from the very nature of the case, can have no part in the restoration which must infallibly be made, the repair which must be undertaken, is more than the fabric of our social life can ever be brought to endure. The loss in any such disturbance falls eventually upon the rank and file of the class of persons involved, however carefully planned and apparently successful in promoting higher wages any agitation may be,— just exactly as the labor and weariness of restoring broken machinery falls on the men whose hands work upon the damaged parts, or as the pain and distress in the injured eye is felt in every nerve of the whole body.

To agitate, to disturb, to break up, to overthrow, and finally to destroy, these are all easy. They require the smallest gifts of mind or of body, but it is too often true in industrial things that men are nearly worshipped who do little else in the interest of their fellow workmen than this very kind of work. So far as the real interest of workingmen goes it would be a thousand fold better if the strong-tongued agitator had never been born.—*Industrial World.*

UNITED STATES MILLER.

PUBLISHED MONTHLY.

OFFICE Nos. 116 & 118 GRAND AVENUE, MILWAUKEE, WIS.

Subscription Price.....$1 per year in advance.
Foreign Subscription.....$1.50 per year in advance.

MILWAUKEE, JANUARY, 1884.

ANNOUNCEMENT:

☞ WM. DUNHAM, *Editor of "The Miller," 69 Mark Lane, and* HENRY F. GILLIG & Co., *449 Strand, London, England are authorized to receive subscriptions for the* UNITED STATES MILLER.

We send out monthly a large number of sample copies of the UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE UNITED STATES MILLER to you for one year.

☞ *The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.*

FLOUR is selling at $40 a barrel at Cour d'Alene mines in Montana.

We acknowledge the receipt of a copy of "The Transactions of the Department of Agriculture of the State of Illinois," from Hon. S. D. Fisher, Secretary. It is the most complete report yet issued by the State.

MR. TRUDGEON, representing the Richmond Manufacturing Co., of Lockport N. Y., made us a short visit during the holidays. His many Milwaukee friends were glad to see him. He goes from here to visit the millers in Ohio and Kentucky.

THE PANSY.—Number one of volume two of "The Pansy," a children's magazine, has been laid on our table. It is published by D. Lathrop & Co., of Boston, Mass., and is full of excellent stories and well-executed engravings for the little ones.

THE UNITED STATES MILLER takes pleasure in acknowledging the receipt on New Year's Eve of a half barrel of the finest beer from Capt. F. Pabst, of the PH. BEST BREWING CO. Capt. Pabst will please accept our hearty thanks, as well as the thanks of everyone employed in and about the whole printing establishment, who took part in enjoying the gift.

"Then let the canakin clink—clink!
Then, let the canakin clink,
A life's but a span, a "printer's" a man—
Why then—let a "printer" drink!"

A practical mechanic of long experience complains of the manner in which belts are abused in many, if not in most mills and shops. He says that the reason belts slip in nine cases out of ten is either that they are too small for the place in which they are used or else they have been damaged by the use of rosin, brown soap, patent compositions containing tar, etc. Any composition containing tar will soon ruin a belt. His advice is to use belts wider than really necessary and to keep them clean and well oiled with good neatsfoot oil.

THE holiday number of the *Northwestern Miller* has come to hand. It shows the result of a good deal of taste, labor, and the expenditure of a considerable sum of money. We think we may say, without fear of contradiction, that as a display of artistic journalism, it is a success. We think, however, that there is almost too much of the æsthetic element to be appreciated by the trade, which is composed of extremely practical men, and that such displays are better adapted to literature especially prepared for the entertainment of the female sex. The holiday number of the *Northwestern Miller* will doubtless make Bro. Palmer solid with the ladies, which ought to make him happy, whether the pecuniary results are gratifying or not. In the language of some modern Shakspeare: "Durn the expense, as long as it tickles the girls."

OBITUARY.

Norman Babcock, a leading citizen of Silver Creek, N. Y., died suddenly from hemorrhage of the stomach, on Wednesday, 26th Dec. Mr. Babcock was, from January 1st, 1865, to July 1st, 1883, a member of the well-known firm of Howes, Babcock & Co., and subsequently Howes, Babcock & Ewell, manufacturers of the Eureka Smut and Separating Machines, and other specialties so well known among millers in all parts of the world. He was about 45 years of age and leaves a wife and two young children, a son aged 11 years, a daughter of 7 years. He was a man of fine social qualities who had hosts of friends, and it would be difficult to find a man who would be missed more than he in the circle where he was personally known and acquainted.

MILWAUKEE FLOURING MILLS.

Name of Mill.	Operated by	Daily capacity.	No. bbls. during 1883.
Phœnix	E. Sanderson & Co	1,000	250,000
Eagle	J. B. A. Kern & Son	1,500	125,000
Northwestern	Schlessinger & Daggett	500	100,000
Daisy	L. R. Hurd, (Manager)	450	80,000
Jupiter	Stern & Wohlrab	500	65,000
Reliance	C. A. Manegold & Co	400	50,000
Gem	F. H. Magdeburg & Co	200	40,000
Star	Nunnemacher & Co	400	40,000
Empire	S H. Seamans & Co	400	35,000
Centennial,	Wm. Gerlach & Co	200	25,000

Total product for 1883.....810,000
" " " 1882.....1,346,509

*All Milwaukee Mills are run by steam power. The City Mills are now operated by C. M. Paine exclusively on rye flour, producing 100 barrels per day. J. B. A. Kern & Son also have a rye flour mill, producing 150 barrels daily. The Cream City Mill and the Ontario Mill are now used principally for feed and grain cleaning and grading purposes.

ABRAHAM LINCOLN WAS NOT A MILLER.

An "old settler" writes to the Clinton *Public* from Kumler, Ill.: "It has been going the rounds of the papers, and yours not excepted, that the old mill alluded to as in Menard Co., on the Sangamon river, was built by W. G. Green, in 1830, and he took Abraham Lincoln in as a partner. I am an old settler and and lived within one mile of that mill nearly half a century ago, when it belonged to Sangaman County, and I know whereof I speak. That old mill was built by Jacob Bailes, and in 1844 the big freshet washed out the dam and wrecked the mill. It stood idle for several years, and Jacob Bailes and his wife died. Then the old mill and what belonged to it, was bought by Abraham Bailes, a brother of the deceased Bailes, and he rebuilt the old mill. He also died, and his sons took charge of the mill. Abraham Lincoln never had anything to do with the mill in any way, for he had nothing with which to build a mill, or anything else. Lincoln lived with old Boling Green, about one mile below this mill. Green was a justice of the peace, and Lincoln commenced the practice of law before him, and succeeded so well that he went to Springfield and studied law with S. T. Logan. 'Squire Green furnished the money to buy books for Lincoln. I mention this to show that Lincoln had no money with which to buy a mill, or an interest in a grocery store, as published. There was a grocery, or what would now be known as a saloon, kept on the bluff in the place known as New Salem. Lincoln was a clerk in the place, but he was never known to be a partner in any business until he commenced practising law at Springfield. It is said that the old mill is burned down. Peace be to its ashes."

To the milling interests of this country the past year may be said to have been one of prosperity. Had the success which attended their labors during the first six months of the year continued throughout, the year would have been a remarkably successful one. With a good demand for breadstuffs for both home and foreign consumption at fairly remunerative values. Millers were enabled to keep their machinery going and felt jubilant. Let us hope for as good a demand in the first six months of the year on which we have just entered. The exports of flour from the sea board for the first six months of 1882, were 2,888,950 bbls., and for the first six months of 1883, 4,535,047; showing an increase of 1,646,097; in favor of the first six months of last year.

The last half of the year, however, has not been so encouraging, this has been mainly due to the manipulations of the wheat market by speculators. The artificial prices to which wheat was forced by these parties putting it beyond the reach of millers; the result being that many mills were closed down as their contracts expired. During the last few months of the year, the foreign demand had fallen off and European buyers were forced to look to other markets of the world for their supplies, in consequence, the business in breadstuffs in the latter part of the year has been light and at considerably reduced prices. In the last, as in former years, large sums have been expended in improving and extending the milling capacity of the country, until almost every flouring mill in the country has undergone a thorough remodeling by replacing the old with new and improved machinery, by which a better quality of flour can be manufactured and a much larger quantity turned out. Although no industry in the country has exhibited so much enterprise and accomplished so much as the milling interest in the way of improvements, it would yet appear that the height of perfection has not yet been reached and that the ingenuity of the miller has not yet been taxed to its utmost. It would indeed seem as if time will cease to be, ere the fertile brain of the miller will cease to scheme on improving the already improved mechanism of his mill; and as every recurring year comes round we may expect new and further improvements. The spirit of enterprise hitherto displayed by western millers in the advancement of milling applications and in the practical and profitable use of such is deserving of our esteem and admiration, inasmuch as every new invention is a benefit to humanity. The finish and workmanship of the finest and most complete flouring mills of the present day is largely due to the energy, enterprise and capital of western millers who have spared no expense in their endeavors to excel all others in the manufacture of wheat into flour, and it is a matter of congratulation that their efforts so far have been crowned with success. The great incubus under which the western miller labors, more especially in Chicago and Milwaukee, is the ever recurring manipulations of the wheat market by unprincipled speculators or gamblers in grain options, by whose operations the wheat market becomes at times utterly demoralized, and the price of this, the staple commodity on which humanity depends for subsistence, is often forced to ten, twenty, and sometimes thirty per cent. above its legitimate market value, thereby placing for the time being a complete barrier between the honest miller and his honest, industrious labor, as in such times and under such circumstances he must either shut down his mill or run at a loss. In any event it is impossible for him for the time being to compete with other millers who have not to encounter and don't labor under such disadvantages; meantime we shall let the manipulator, gambler or speculator (whichever you like to call him by,) alone, reserving our ideas and opinion of him for our next issue.

With the western miller the study of economizing does not stop with the mill proper. In these times competition in the sale of breadstuffs runs high, and to enable him to cope with his competitors, he brings the office into use, and instead of employing agents or commission men on this side of the Atlantic to dispose of and ship the product of his mills, he does this work to a very large extent, thereby saving commissions on this side. Besides, most millers in the export business now have their own private cable codes, made up in such complete and condensed form as to effect a great saving in cabling.

Reliable statistics not having yet reached us as to the movement of flour for the latter part of last year, we cannot yet make up our annual report, but hope to be in a position to lay it before our readers in our next issue.

With these few remarks we extend to our subscribers and readers in general, our best thanks for their patronage and support, wishing that the New Year on which we have just entered, may be a happy and prosperous one to us all.

DETERIORATION OF WHEAT.

The question, Why does wheat deteriorate so rapidly in this country as compared with some foreign lands? is constantly presenting itself to the mind of the careful observer. There are lands in England that have been cultivated for thirteen centuries, which now produce a better crop than they did at first, while half a century of wheat growing in some sections in this country has made this crop unprofitable. Aside from the conditions of climate, the soil must supply the proper elements of the plant's food. As these are exhausted they must be re-supplied by the fertilizers that contain them, or by a rotation of crops adapted to the same object. Experience shows also the necessity of a most careful selection, and a frequent renewal of seed, which, constantly resown on the same land, tends to deteriorate. New varieties of wheat will often advantageously replace the old. But with favorable climate, good soil and seed, a thorough, intelligent cultivation is also indispensable to continued success. The proper pulverization of the soil and its due exposure to air and sunlight, are necessary to render it available to the delicate wheat plant as a source of nutriment and growth. Everywhere in the vast wheat fields of the Northwest, as well as on the old farm lands of Europe, "high cultivation" will bring its reward.—*American Miller.*

The past season has been very favorable for the flour trade in Cincinnati. The receipts have exceeded those of any previous year, aggregating 1,144,464 barrels against 779,625 in 1881-2. The shipments reached 1,014,379 barrels against 612,821 in the preceding year. The average price for family flour at Cincinnati has been $4.76 against $6.18 in 1881-82; for extra $4.05 against $5.56.4; for superfine $3.46.2 against $4.81.8 in 1881-2. The stock of flour at Cincinnati June 1, 1883, was 36,306 barrels against 34,257 at the corresponding date in 1882.

(Compiled for THE UNITED STATES MILLER.)

THE MILLING PATENTS FOR 1883.

The following Milling Patents were issued during the year 1883:

Bearing date, January 2d, 1883.

Elevator Bucket, William Eagan, Somerville, Mass.
Grinding Mill, Levi M. Devore and Daniel C. Stover, Freeport, Ill.
Millstone Driver, Henry Heard, Greensborough, Ga.
Wheat Grader and Cockle Separator, Judson N. Merchant, Bloomingdale, Mich.
Wheat Scouring Apparatus, Franz X. Stiefenhoper, South Easton, Pa.

January 9.

Horse Power Sweep for Grinding Mills, Edward M. Wilcox, Whitewater, Wis.
Automatically Cooling Hot Journals, Franz O. Mathieson, Irvington, N. Y.
Apparatus for keeping cool the Shaft bearings in Mills Franz O. Mathieson, Irvington, N. Y.

January 16.

Grain Meter, George B. Lynch and Thomas J. Griffith, Darlington, Ind.
Grain Separator and Cleaner, John M. Lawrenson, Silas M. Stadon and Henry Lawrenson, Moreland, Pa.
Grinding Mill, James M. Collier, Atlanta, Ga.
Grinding Mill, Charles W. Lawrence, Chelsea, Mass.
Feed Grinding Mill, Edward H. Morgan and Charles Morgan, Freeport, Ill.

Jan 23.

Portable Grain Elevator and Weigher. Mortimer Scanlon and John T. Hough, Chicago, Ill.
Process of, and Apparatus for Cleaning Grain (Re-issue) William L. Teter, Philadelphia, Pa.
Method of Milling and Apparatus used therein, Abel Mariotte, Vereaux, France.
Millstone Driver, Amos Callahan, Maryville Tenn.
Grain Weigher and Tally, George Keith, Jr., Freedom, Ill.

January 30

Air Separator and Feeder for Bolts, etc., Robert Wilson, Greenup. Ky.
Flour Dresser, Louis W. Pruss, Minneapolis, Minn
Flour Dressing Machine, Louis W. Pruss, Minneapolis, Minn.
Apparatus for the Gradual Reduction of Grain, William D. Gray, Milwaukee, Wis.
Bail and Driver for Millstones, Jacob M. Replogle, Farragut, Iowa.
Millstone Driver, James F. Callahan, Knoxville, Tenn.
Roller Mill, Sherman B. Rickerson, Coopersville, Mich.
Grain Sieve, Samuel McClure, Brooke Township, Lambton Co., Ont., Canada.

February 6.

Bolting Reel, John D. Hurst, Salem, Oregon.
Centrifugal Flour Bolt, Abel P. Holcomb and August Heine, Silver Creek, N. Y.
Roller Reduction Machine for Flour Mills, Harley M. Rounds, Clear Lake, Iowa.
Grain Cooler and Dryer, Sheldon P. Cook, Minneapolis, Minn.
Middlings Purifier, John Smith, Rochester, N. Y.
Millstone Dressing Machine, Cornelius S. Hoover, Lancaster, Pa.
Millstone Driver, Philip Steinmetz, Philadelphia, Pa.
Screen Cleaning Device, Thomas Holman, Salem, Oregon.
Screw Conveyer Coupling, Towner K. Webster and John Chivill, Chicago, Ill.
Gate for Turbine Wheels, Eben B. Williams, Forestdale, R. I.
Water Wheel, Augustus Figge, Middlesex, England.

February 13.

Grain Cleaner, John Burkholder, Centerburgh, Ohio.
Grain Separator, Martin Wilcox, Paskenta. Cal.
Grinding Mill, Charles W. Lawrence, Chelsea, Mass.
Grinding Mill, Silas C. Schofield, Freeport, Ill.
Roller Grinding Mill, Cyrus T. Hanna, Allegheny, Pa.
Feed Hopper, Walter M. Rand, Olney, Ill.

February 20.

Dust Collector for Flour Mills, Faustin Prinz, Dundas, Minn.
Pinion Lifter or Apparatus for Gearing and Ungearing Mills and other Machinery, John R. Underwood and George W. Smith, Nash County, N. C.
Grain and Seed Cleaning Mill, William Bowen, Edina, Mo.
Grain Cleaning Apparatus, William Shaw, Paris, Ky.
Apparatus for Measuring and Weighing Grain, F. C. Mason, Ransom, Mich.
Middlings Purifier, Faustin Prinz, Dundas, Minn.
Roller Mill, Charles B. Campbell, Buffalo, N. Y.
Water Wheel Bucket, Charles D. Smith, Amador City, Cal.
Turbine Water Wheel, Marquis D. Grow, Dubuque, Iowa.
Turbine Water Wheel, Bernard Keiser, Ferndale, Pa.

February 27.

Clutch, William D Ewart, Chicago, Ills.
Grain Cleaning Machine, Charles F. Shumaker, Silver Creek, N. Y.
Grinding Mill, Daniel C Stover, Freeport, Ills.
Test Plate for Roller Mills, William D. Gray, Milwaukee, Wis.
Wave Power Apparatus, Thomas Mayes, Albany, N. Y.

March 6.

Dust Collector, Noah W. Holt, Buffalo, N. Y.
Millstone Paint Staff, Martin W. Leonhardt, Sedalia, Mo.

March 13.

Drive Chain, Eugene L. Howe, Chicago, Ills.
Drive Chain Link, August S Held, Freeport Ills.
Flour Bolt, Henry A. Graeter, Wooster, Ohio.
Grain and Offal Drier, Richard E. Schroeder, Chicago, Ill.
Decorticating Machine for Grain, Joseph Jurt, Cullman, Ala.
Apparatus for Drying and Cleaning Grain and Ventilating Buildings, Morrill A. Shepard, Lebanon, Ill.

Tuard Grinding Mill, James F. Winchell, Springfield, Ohio.
Endless Belt Conveyer, William R. Fowler, Philadelphia Pa.
Belting, Edwin M. Cross, Syracuse, N. Y.
Centrifugal Reel, John J. Walterhouse, Vincennes, Ind.
Grinding Mill, Robert McCully, Philadelphia, Pa.
Mill Disk Dress, Louis Gathman, Chicago, Ill.

March 27.

Bolting Reel, Edwin S. Phillips and Stephen A. Kealy, Lewisville, Tex.
Cockle Machine, John Lucas, Hastings, Minn.
Flour Packer, Heman A. Barnard, Moline, Ill.
Grain Cleaner, John E. Cummins, Arlington, Ky.
Grain Elevator, James B. Pelton, Frederick Co., Md.
Grain Purifier and Separator., Carl F. A. Gramke, Stettin, Prussia, Germany.
Grinding Mill, John Beall, Decatur, Ill.
Automatic Grain Measure, John L. Mayer and Joseph Sutter, McLean Co., Ill.
Roller Mill, Daniel W. Marmon, Indianapolis, Ind.
Shaft Hanger, Walter J. F. Liddell, Charlotte, N. C.
Shaft Coupling, Walter J. F. Liddell, Charlotte, N. C.
Shaft Coupling, August Loehner, St. Louis, Mo.
Turbine Wheel, Nathan F. Burnham, York, Pa.

April 3.

Conveyer for Mill Products, Robert Craik, Hawley, Minn.
Grain Cleaner, Separator and Grader, William E. Wild, Candalara, Nev.
Gauge for Dressing and Truing Millstones, Hamilton Dudley Colman, New Orleans, La
Roller Mill, Daniel W. Marmon and Jesse Warrington, Indianapolis, Ind.
Sieve for Roller Mills, Henry J. Gilbert and George A. Gilbert, Racine, Wis.

April 10.

Conveyer, William H. Felthousen, Baltimore, Md.
Roller Grinding Mill, Samuel L. Bean, Washington, D. C.
Roller Grinding Mill, William Tennant, Faribault, Minn.
Roller Mill, John Livingston, Dayton, Ohio.

April 17.

Apparatus for Casting Hollow Chilled Rolls, John M. Case, Columbus, O.
Machine for Consolidating Loose and Bulky Material into Solid Blocks, William Harold Smith, Chicago, Ill.
Means for Adjusting and Supporting Millstones, George Millbank, Chillicothe, Mo.
Reduction Machine, John M. Case, Columbus, Ohio.
Roller Mill, Daniel W. Marmon, Indianapolis, Ind.
Roller Mill, Frederick W. Wegmann, Zurich, Switzerland.
Water Mill Isaac R. Kelp, Hatfield, Pa

April 24.

Bolting Regulator, James E. Fiske, Jamestown, N. Y.
Cockle Screen, John B. Cornwall, Moline, Ill.
Roller Mill, Henry J. Gilbert, Racine, Wis.
Roller Mill, Daniel W. Marmon, Indianapolis, Ind.
Water Wheel, Michael I. Martin, Fort Wayne, Ind.
Water Wheel, Joseph M. Powell, Springfield, Ill.
Machine for Hulling and Cleaning Wheat, Samuel K. Todd, Eugene, Ind.

May 1.

Combined Pneumatic Grain Elevator Conveyer and Cleaner, Mahlon Randolph, New York.
Grain Scourer, Swan Hanson, Moline, and J. Silas Leas, Rock Island, Ill.
Grain Shovel, Michael W. Hanley, Chicago, Ill.
Grinding Mill, George W. Doolittle, Kansas City, Mo.
Drop Lift for Mill Machinery, Lawrence B. Kuhle and William B. Hamilton, Lima, Ohio.
Machine for Mixing Flour and other Substances, Philip Thorpe, New York.
Pulley Covering, William W. Campbell, Indianapolis, Ind.
Smut Machine, P. Victor Hennick, Buffalo, N. Y.
Sprocket for Rope and similar Belts, Jonathan Mills, Chicago, Ill.

May 8.

Mill Stuff Recovering Machine, Drew H. Lord, Northfield, Minn.
Millstone Balance, Wm. C. Hale, Austin Springs, Tenn.
Automatic Paper Bag Filler, Thomas H. Hill, Philadelphia, Pa.
Roller Mill, Daniel W. Marmon, Indianapolis, Ind.
Wheat and Flour Scale, George M. Knight, Adrian, Mich.

May 15.

Belt and Bucket Elevator, Peter Okell, Fort Madison, Iowa.
Driving Belt, Charles C. Campbell, Cincinnati, Ohio.
Grain Car Unloader, John H. Chase, Rochester, N. Y.
Conveyer for Flour Bolts etc., Chas. B. Slater, Blanchester, O.
Flour Packer, Joseph B. Martin, Silver Creek, N. Y.
Gear Wheel, Henry Stanley and Nicholas Cornelius, St. Louis, Mo.
Apparatus for the Reduction of Grain, Henry F. St. Requier, Asnieres, France.
Grain Drying and Cooling Shelf, Henry Cutler, North Wilbraham, Mass.
Millstone Driver, John Dempster, Knoxvile, Tenn.
Roller Mill, Jesse Warrington Indianapolis, Ind.
Cut-off for Screening Devices for Middlings, Flour etc., George Cottreal, San Francisco, Cal.
Turbine Water Wheel, Cyrus M. Baker, West Waterville, Maine.

May 22.

Feed Water Heater. Edwin R. Stillwell, Dayton Ohio.
Flour Dressing Machine, Andrew Hunter and Ernst Kuehne, Chicago, Ill.
Flour Packer, John Handy and Drew H Lord. Northfield, Minn.
Grain Decorticator, Silas Dodson, Rochester, N. Y,
Grain Scourer and Polisher, Jacob J. Souder, Washington, D. C.
Middlings Purifier, Andrew Hunter, Chicago, Ill.
Middlings Purifier, Joseph W. Wilson, Wyandotte, Kan.
Machine for Hulling and Polishing Rice, Latimer S. Seaver, Boston, Mass,
Roller Mill, Sherman B. Richerson, Grand Rapids, Mich.
Grain Weighing Apparatus, William H. Ernst, Chase. Ks.
Automatic Grain Weighing Machine, John Stevens. Neenah, Wis.
Wheat Huller, Thomas T. Kneeland, Tecumseh, Mich.

May 29.

Manufacture of Flour from Grain, Louis Gathmann, Chicago, Ill.
Millstone Dressing Machine, Cornelius S. Hoover, Lancaster, Pa.
Shaft Hanger, Hilan C. Crowell, Erie, Pa.

June 5.

Flour Dressing Machine, Wm. D. Gray, Milwaukee, Wis.
Machine for Dampening or Wetting Grain, John Miller, Milton, Oregon
Grain Shovel Mechanism, John S. Metcalf, Indianapolis, Ind
Grinding Mill. Edwin G. Hastings, Nevada, Iowa.
Grinding Mill, Abram N. Wolf, Allentown, Pa.
Grist or Flouring Mill, Abel Mariote, Vereaux, France.
Flour Sifting Machine, Hermann E. L. Bauermeister, Hamburg Germany.

June 12.

Bran Duster, Levi S. Hogeboom and Frank B. Smith, Three Rivers, Mich.

June 19.

Bran or Flour Packer, Henry G. Hall, Fayetteville, N. C.
Bran Packer, Jared E Belt, Minneapolis, Minn.
Driving Chain or Belt, Levi H. Goodwin, Cincinnati, O.
Apparatus for Disintegrating Grain etc., Francis Taggart, Brooklyn, N. Y.
Flour Packer, Charles F. Walters, Richmond, Ind.
Grinding Mill, Udolpho H. Odell, Dayton, O.
Roller Grain Mill, Oscar W. Tresselt, Fort Wayne, Ind.
Turbine WaterWheel, Cornelius Bernhart, Walker Valley, N. Y.

June 26.

Feeder for Mill Boils, Thomas Reid, Walkerville, Ont , Can.
Roller Mill, Henry J. Gilbert, Dayton, Ohio.
Roller Mill, John Livingston, Dayton, Ohio.
Feed Mechanism for Roller Mills, Wm. M. Jewell, Denver, Col.
Grain Tally, John E. Fellers, Burlington Ind.
Turbine, Abijah Woodward, Keene N. H.
Turbine Water Wheel, Joseph Kaab, Dayton, Ohio.

July 3.

Bolting Reel, James S. Van Slyke, Ottawa, Kan.
Bran or Flour Packer, Abner L. Stevens, Huntingdon, Pa.
Process of and Apparatus for Packing Bran, Rudolph M. Hunter and James T. Stewart, Philadelphia, Pa.
Drive Chain, William D. Ewart, Chicago, Ill,
Centrifugal Flour Bolt, Abel P. Holcomb and August Heine, Silver Creek, N. Y.
Middlings Purifier, George R. Cannefax, Dixon, Mo.
Millstone Pick, William C. McDonnell, and Axel L. Anderson, Montello, Wis.

July 10.

Drive Chain, Adolph Assmus, Chicago, Ill.
Elevator Bucket, Henry W. Caldwell, Chicago, Ill.
Grain Elevator, William Watson, Memphis, Tenn.
Automatic Grain Meter, Elihu M. Thorpe, Wapello, Ill.
Belt Fastener, Hubert C. Hart, Unionville, Conn.
Grinding Mill, Thomas O. Cutler, Jersey City, N. J.
Roller Grinding Mill, James B. Allfree, Cumberland, Md
Wheat Cleaner, Dandridge P. Motley, Rexburgh, Va.

July 17.

Method of and Device for Preparing and Packing Bran, etc., Wm. A. Morrison, Cambridge, Mass.
Process of Drying Grain, Ferdinand Schumacher, Akorn. Ohio.
Grain Elevator, Nathaniel G. Simonds, Charleston, Mass.
Grain Separator, Josiah M. Welbourn, Edison, Ohio.
Roller Mill, Eli T. Butler, Hamilton, Ohio.
Separator and Purifier for Meal, etc., George W. Wilson, Lanesborough, Minn.
Water Wheel, George W. Converse, Spokane Falls, Wash. Ter.
Wave Power, William E. Joy, San Francisco, Cal.

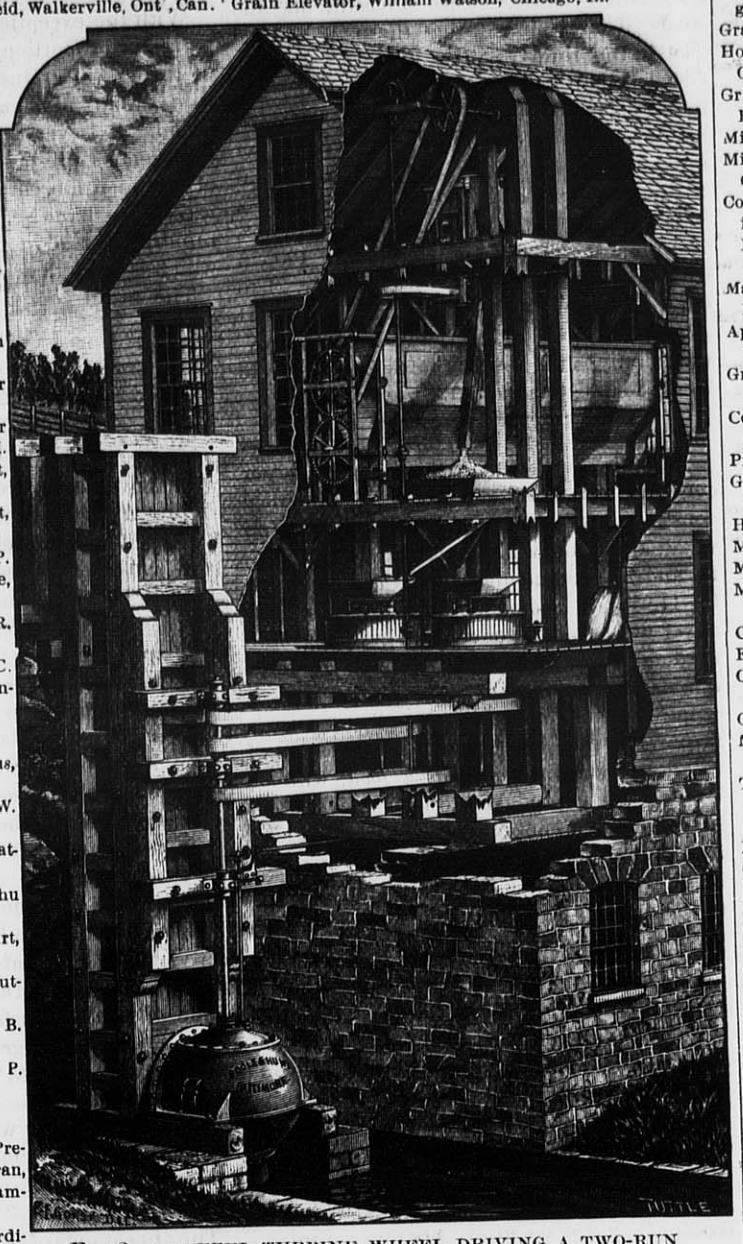

FIG 2—A LEFFEL TURBINE WHEEL DRIVING A TWO-RUN FLOURING MILL.

Grain Separator P. Van Gelder, Sowerby Bridge, County of York, England.
Grinding Mill, Christian A. Fredericks, Brooklyn, N. Y.
Automatic Grain Measure, Wilbur R. Dunkel, Macon, Ill.
Millstone Ventilator, Hermann J. Nellessen, Pittsburgh, Pa.

August 7.

Chain, Benjamin A. Legg. Columbus, Ohio.
Drive Chain, Chester A. Weller, Sing Sing, N. Y.
Grain Elevator, William Watson. Memphis, Tenn.
Machine for Separating Grain, Meal, etc., John Damp, Ashland, Ohio.
Grain Separator, William Crain, Castroville, Cal.
Machine for Dressing Millstones, John T. Obenchain, Logansport, Ind.
Separator, Winfield O. Gunckel, Terre Haute, Ind.
Roller Feed Mechanism, Winfield O. Gunckel, Terre Haute, Ind.

August, 14.

Machine for Separating Cockle, etc., from Grain, Giles S. Cranson, Silver Creek, N. Y.
Grain Elevator, Amy Bardeen, Blackstone, Mass.
Machine for Hulling and Granulating Grain, Giles S. Cranson, Silver Creek, N. Y.
Machine for the Gradual Reduction of Grain, William D. Gray, Milwaukee, Wis.
Grain Meter, George B. Lynch, Darlington, Ind.
Vertical Disk Grinding Mill, Henry Cutler, North Wilbraham, Mass.
Grain Weighing and Bagging Machine, James B. Pelton, Mount Pleasant, Md.

August 21.

Cut-off for Bolting Chest Conveyers, Lawrence B Kohule and William B. Hamilton, Lima, Ohio.
Machine for Cleaning Split Grain, Louis Gathmann, Chicago, Ill.
Grinding Mill, Silas C. Schofield, Freeport, Ill.

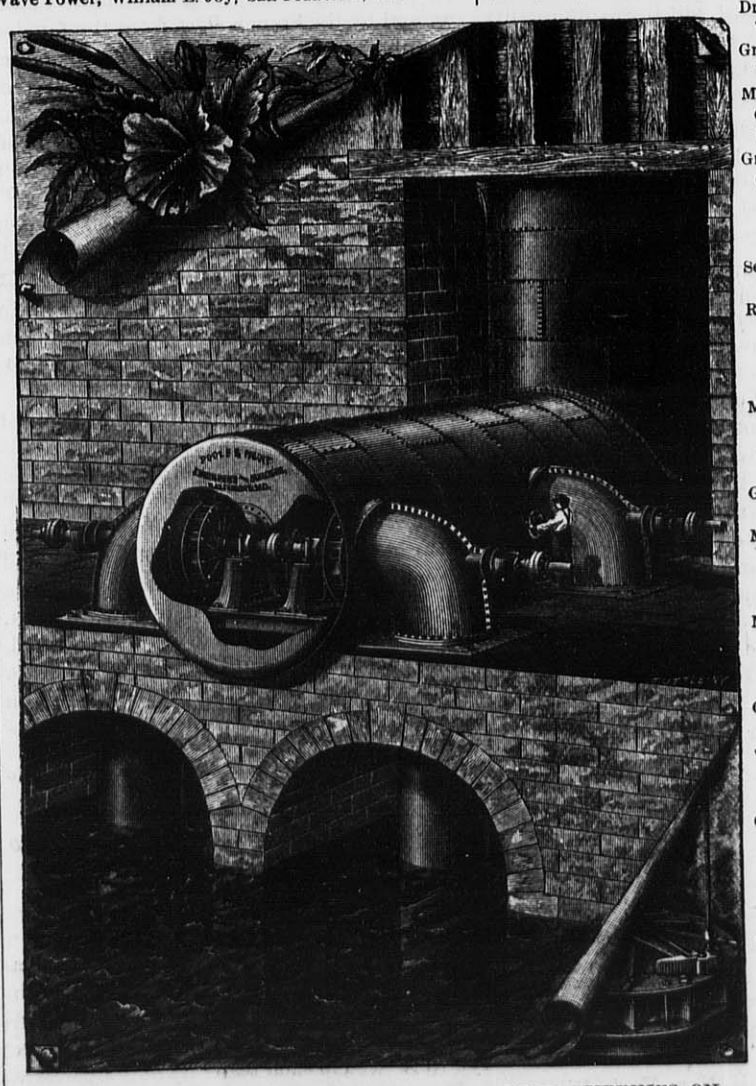

FIG. 3—FLUME AND CASING CONTAINING FOUR TURBINES ON TWO HORIZONTAL SHAFTS.

Construction of River and other Weirs and Sluice Gates, Francis Wiswall and William H. Collier, Manchester, County of Lancaster, England.

July 24.

Drive Chain Link, August S. Held, Freeport, Ill.
Means of Attaching Elevator Buckets to Belts, Frederick A. Wittich and Peter W. Strader, Ashtabula, Ohio
Grain Separator and Grader, Pieter Van Gelder, Sowerby Bridge, York Co., England.
Grain Dryer, Joel C. Slaughter, Chestertown, Md.
Roller Grinding Mill, Robert Morrell, Montclair, N. J.
Millstone Driver, George C. Gordon, Moundsville, W Va.

August 28.

Bolting Chests, Lawrence B. Kohule and William B. Hamilton, Lima, Ohio.
Centrifugal Reel, Louis W. Pruss, Minneapolis, Minn.
Grain Drier, Albert E. Clutter, Lima, Ohio.
Apparatus for Pulverizing Grain, Ores, etc., Francis Taggart, Brooklyn, N Y.
Roller Mill, John Livingston, Dayton, Ohio.
Grinding Mill, Edgar, H. Morgan and Charles Morgan, Freeport, Ill.
Grinding Mill, Frank Wilson, Easton, Pa.

July 31.

Packing Bran, etc., Henry Bower, Philadelphia, Pa.
Chain, William H. Dickey. Jackson, Michigan.
Cockle Machine and Grain Separator, Thomas M. Bales and Jacob A. Jackson, Des Moines, Iowa.
Dam and Lock, John Du Bois, Du Bois, Pa.
Grain Elevator, William Watson, Chicago, Ill.
Water Mill, Christopher Freiderich Carl Steinhagen, Anderson, Texas.

September 4.

Endless Belt Conveyer, Edward H. Parker, Eau Claire, Wis.
Belting, John Murphy, Brooklyn, N. Y.
Process of Curing Cereals, George Davis, Ottawa, Minn.
Grain Cleaner, John Russell, Berlin, Pa.
Grain Drier and Cooler, Winsor Beebe, Buffalo, N. Y.
Grain Elevator, John E. Walsh. New York. N. Y.
Grain Separator, Milton Forder and Timothy H. Pendergast, Dassel, Minn.
Grain Separator, John Russell, Berlin, Pa.
Hopper for Grain Separator, James Root, Black's Station, Cal.
Grinding and Decorticating Mill, Robert H. Minister, Baltimore, Md.
Middlings Purifier, John Russell, Berlin, Pa.
Millstone Dress, David H. Brooks, Washington, Edgefield Co., S. C.
Combined Bracket and Adjustable Box-bearing for Shafting, Lawrence B. Kohule and William B. Hamilton, Lima, Ohio.

September 11.

Machine for Cleaning Grain, John R. Reynolds, Jackson, Mich.
Apparatus for Grain Drying and Coffee Roasting, William W. Dunn, Fort Worth, Texas.
Grinding Mill, Gustavus B. Maynadier, Boston, Mass.

September 18.

Cockle Machine, Middleton Crawford, Wiarton, Ontario, Canada.
Pneumatic Grain Elevator, Joseph Lewis, Chicago, Ills.
Grinding Mill, H. Jay Hammond and Herbert S. Wilson Kalamazoo, Mich.
Hominy Mill, William Stonebraker, Hagerstown, Ind.
Middlings Purifier, John Harvey, Brooklyn, N. Y.
Millstone, John E. Ethel, St. Louis, Mo.
Millstone Dress, Joseph C. Spindle, Loretto, Va.

September 25.

Conveyer, Frank L. Pearce, Chicago, Ill.
Flour and Meal Bolt, William Mosher, Poughkeepsie. N. Y.
Centrifugal Flour Bolt, Abel P. Holcomb and Aug. Heine, Silver Creek, N. Y.
Grinding Mill, John Fitzgerald, Brooklyn, N. Y.
Millstone Driver, William Carter Hale, Austin Springs, Tenn.
Turbine for Steam and other Motive Powers, Gustaf De Laval, Stockholm, Sweden.

October 2.

Elevator, Charles H. Bidwell, Albion, N. Y.
Compound Meal or Flour and Process of Making the same, John Masters and Miles Masters, Bureau Junction, Ill.
Automatic Grain Weigher and Register, William B. Patterson, Secor, Ill.

October 9.

Drive Chain, Thomas Shields, St. Louis, Mo.
Grain Drier, John C. Jacoby, Polk, Ohio.
Machine for Steaming or Drying Grain, Luther V. Moulton, Grand Rapids, Mich.
Machine for Dressing Rollers for Grinding Mills, Fred Messer, Beloit Wis.
Diamond Millstone Dressing Machine, Thomas C. Barnes, Logansport, Ind.
Roller Mill. Noah W. Holt, Buffalo, N. Y.
Water Wheel. Henry B. Stevens, Buffalo, N. Y.

October 16.

Elevator Bucket, Stanley L. Chapman, Winnetka, Ill.
Grain Conveyer, Frank Pierce, Chicago, Ill.
Machine for Reducing Wheat and other Grain, Olden H. Titus Wilmington, Del.
Automatic Grain Meter, George W. Sharp, Crawfordsville, Ind.
Mode of and Mechanism for Cleaning Grain, William L. Teter Philadelphia, Pa.
Grinding Mill, Gustavus B. Manadier, Boston. Mass.
Automatic Feed Regulator for Grinding Mills, John Wesley Hilliard, Hawley, Minn.
Apparatus for Mixing Meal or Flour, Charles Le Mee, Yffiniac, France.
Automatic Grain Weighing Apparatus, David D. Kuhlman, New York. N. Y.

October 23.

Apparatus for Feeding Flour to Bolting Reels, Elgin L. Conklin, Corning, N. Y.
Bran Compressor, John L. Rail, Boone, Iowa.
Elevator Bucket, Robert B. Little, Providence, R. I.
Flour Dressing Machine, Middleton Crawford, Wiarton, Ontario, Canada.
Grain Separator and Cleaner, Heber Parish, Burlington, Iowa.
Pneumatic Elevator, Joseph Lewis, Chicago, Ill.
Feed Mechanism for Roller Mills, George V. Hecker, New York, N Y.
Machine for Scouring Wheat, etc., John T. Ewan, Bethalto, Ill.
Water Wheel, Lawrence C. Ryan, Hawkinsville, Ga.

October 30.

Centrifugal Bolting Machine, Ferdinand Stetter, Dubuque, Iowa.
Corn Sheller, George Prichard, Prichardville, Minn.
Grain Elevator, William Watson, Memphis, Tenn.
Grain Meter, Hazael Griffith, and Lewis F. Ramsay, Terre Haute, Ind.
Grain Screen, Chapman E. Gage, Whitehall, Wis.
Feeder for Grinding Rolls, Gardner B. Root, Amherst, Wis.
Middlings Purifier, Christian Wehner, New York, N. Y.
Turbine Water Wheel, Henry R. Austin, Norwood. N. Y.

November 6.

Crushing and Grinding Machine, George J. Shimer, Freemansburgh, Pa.
Dust Collector, Phineas Chaney, Jr., Brooklyn, N. Y.
Machine for Bolting Flour and Cleaning Middlings, Benjamin F. Trimmer, Rochester, N. Y.
Grinding Mill, Solomon Lucats, Nashville, Tenn.
Middlings Purifier, Joseph Kuhnmunch, Rottengen-on-the-Tauber, Germany.

November 13.

Centrifugal Separator, Winslow P. Northway, Minneapolis, Minn.
Elevator Bucket, Nathaniel S. Ackerly, Huntington, N. Y.
Elevator Bucket, Frank T. La Rose, Pawtucket, R. I.
Conveyer for Flour Bolts, etc., George E. Mount and Edgar Bassett, Jackson, Mich.
Grain Drier, John Gregory and Valentine Lapham, Marion, Ohio.
Machine for Drying Grain, Luther V. Moulton, Grand Rapids, Mich.
Grain Elevator, Marquis F. Seeley, Fremont, Neb.
Cylinder for Grain Scourers, John H Chase, Rochester, N Y.

November 20.

Process of and Mechanism for removing Bran from Wheat, Anton Schwarzwaelder, Minneapolis, Minn.
Flour Bolt, Josef Nicht, Auburn, N. Y.
Middlings Purifier, Theodore H. Neander, Wataga, Ill.
Roller Mill, Eli Strong, Kalamazoo, Mich.
Roller Mill, Abraham W. Wolf, Allentown, Pa.
Feed Mechanism for Roller Mills, Noah W. Holt, Buffalo, N. Y.
Automatic Grain Weighing Apparatus, David D. Kuhlman, New York, N. Y.

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, Nos. 116 & 118 GRAND AVENUE, MILWAUKEE, WIS.

SUBSCRIPTION PRICE.—PER YEAR, IN ADVANCE.

To American subscribers, postage prepaid.....$1 00
To Canadian subscribers, postage prepaid..... 1 00
Foreign Subscriptions..... 1 50

All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.

Bills for advertising will be sent monthly, unless otherwise agreed upon,

For estimates for advertising, address the UNITED STATES MILLER.

[Entered at the Post Office at Milwaukee, Wis., as second class matter.]

MILWAUKEE, JANUARY, 1884

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. *You will thereby oblige not only this paper, but the advertisers.*

IT is said that Great Britain consumes about $300,000,000 worth of flour per annum.

ABOUT 4,500 miles of railroad track were laid in the United States during the year 1883, exclusive of side tracks.

A medal was awarded to the Nordyke & Marmon Co., Indianapolis, Ind., "for the best display of milling machinery" at the Southern Exposition, recently held at Louisville, Ky.

A Williamsburg County, S. C., correspondent writers :—"There is scarcely any wheat raised in this county and our flour mills don't amount to much. We plant cotton and skin pines for turpentine and buy all our flour.

A coal oil lamp exploded in London, Ontario, the other night, and a quick-witted young woman extinguished the flames by emptying a bag of bran over them.—*Ex.*

If this innocent Canadian virgin had read the milling newspaper articles on the explosive qualities of all kinds of flour-mill products, she would no sooner have tried to quench the flames with bran than she would with a bag of blasting-powder.

W. J. McElroy, for a number of years connected with the Jno. T. Noye Mfg. Co., Buffalo, N. Y., tendered his resignation, on the 20th inst. He was presented with a valuable present as an evidence of the esteem and regard in which he was held by his associates. Mr. McElroy leaves to take charge of Ames & Sons mills, Syracuse, N. Y.

WITH the New Year, Messrs. Edw. P. Allis & Co., of the Reliance Works, Milwaukee, commence the publication of a newspaper named "*The Millwright and Engineer.*" It will be edited by Mr. Albert Hoppin, formerly owner of *The Northwestern Miller* of Minneapolis. We are informed that it will be very attractive in appearance and there is no doubt but that it will be well received by the press and public generally. Mr. Hoppin has had a good deal of editorial experience and with the facilities at his command will doubtless produce a very meritorious journal. Success to it.

Persons, says an exchange, who fancy that wetting coal increases the heat in the furnace, may be interested to know that a series of tests was made recently at Bochum, Germany, to determine the value of wet and dry bituminous coal in making steam. Washed slack, holding 18 per cent. of water and 9.9 per cent. of ash, evaporated 5.7 pounds of water per pound of fuel; while the same coal, with only 3 per cent. of water, made from 8 to 8.5 pounds of steam. Making due allowance for moisture by reducing to a standard of like quantities of coal from moisture, there is found to be a direct loss, by using wet coal, of 14 per cent.

The London *Times* says that statisticians have pronounced the United States to be not only potentially, but actually, richer than the United Kingdom. Counting the houses, furniture, manufactures, railways, shipping, bullion, lands, cattle, crops, investments and roads, it is estimated that there is a grand total in the United States of $49,770,000,000. Great Britain is credited with something less than $40,000,000,000, or nearly $10,000,000,000 less than the United States. The wealth per inhabitant in Great Britain is estimated at $1,160, and in the United States at $995. With regard to the remuneration of labor, assuming the produce of labor to be 100, in Great Britain 56 parts go to the laborer, 21 to capital, 23 to government. In France 41 parts go to labor, 36 to capital, and 23 to government. In the United States 72 parts go to labor, 23 to capital, and 5 to government.

GERM IN FLOUR.

According to Prof. Kick less than three per cent. of wheat (2.93) is germ. The chemical constituents of germ are as follows: Starch 41.22; albuminoids 22.66; gum and sugar 9.72; fat and oil 5.40; cellulose 5.96; ash 3.99; water 11.05. It seems entirely probable that never more than 2 per cent. of germ gets into flour, and that this tends to make the flour of a dark color, thereby reducing its market value. We believe that generally too much importance has been paid to the question of whether flour was better *as a food*, with or without the germ. We do not believe it is a matter of great consequence, but we do know that flour from which most of the germ is absent is whiter, and will bring more money to the miller's pocket, and so long as this is the case germless flour will be produced.

[Written for the UNITED STATES MILLER.]

RYE AND RYE MILLING,

The scientific or botanical name of rye is *Secale cereale*. This species of grain has been cultivated from time immemorial, and is supposed to be a native of the Caspian Caucasian desert. It is mentioned in Exodus C. IX v. 32, which reads as follows:

"But the wheat and the rye were not smitten, for they *were* not grown up."

The grains resemble those of wheat, but are smaller and of a browner color. It is very extensively cultivated throughout Europe, and the acreage of rye has been constantly increasing from year to year in this country. In the north of Europe it is a principal article of human subsistence. The preparation and culture of rye are essentially the same as for wheat, but the same quality of soil is not equally suited to each. It will grow in regions too cold for wheat, and soils too poor and sandy for other grain, and it does well in any climate where wheat can be successfully raised.

It was formerly usual to sow rye together with an early kind of wheat. The harvested grain, thus necessarily intermixed, was termed *meslin* from miscellanea; it also obtained the name of *mung-corn*, corruptly from *monk-corn*, because bread made with it was commonly eaten in monasteries. Its average yield is greater than that of wheat, being nearly fourteen bushels for a period of years throughout this country, while that of wheat slightly exceeds twelve bushels. The extent of the cultivation of this cereal in the United States and the approximate value of the crop during a period of ten years will be made clear by the following table, compiled from the records of estimates of the Department of Agriculture:

Year.	Total Production.	Total Area of Crop.	Total Value of Crop.
	Bushels	Acres.	
1871.....	15,365,500	1,069,531	$12,145,646
1872	14,888,600	1,048,654	11,363,693
1873	15,142,000	1,150,355	11,548,126
1874.....	14,99 ,900	1,116.716	12,870,411
1875	17,722,100	1,359,788	13,631,900
1876	20,374,800	1,468,374	13,635,826
1877 ...	21,170,100	1,412,902	12,542,895
1878	25,842,790	1,622,700	13,592.826
1879	23.639,460	1,625,450	15.507,431
1880	24,540,829	1,767,619	18,564,560
1881.....	20,704,950	1,789,100	19,327 415
Total.....	214,382 029	15,431,189	154,730,729
Annual Aver.	19,489.275	1 402,835	14,066,430

The rye crop shared in the disaster that overtook wheat in 1881, and made the lowest yield in ten years.

Pennsylvania, Illinois, New York, Wisconsin and Iowa are the principal factors in the supply of this cereal, producing nearly two-thirds.

There are two varieties of this species, occasioned more probably by difference of culture than by any inherent variation in the plants; one is known as winter, and the other as spring rye, the former being generally the most productive.

Rye is largely used for bread making, both in America and Europe, and is the common bread-corn in all the sandy districts to the south of the Baltic Sea and the Gulf of Finland, furnishing abundance of food for the numerous inhabitants of places which, without it, must have been little better than sandy and uninhabited deserts.

With the exception of wheat, rye contains a greater proportion of gluten than any other of the cereal grains, to which fact is owing its capability of being converted into a spongy bread. It is very nutritious, being rich in nitrogenous substances, which are made up of albumen, mocedin and gluten caseine, and it contains, likewise, nearly five parts in every hundred of ready-formed saccharine matter, which is more than wheat.

The mean composition of rye flour is as follows:

Water	14.24
Nitrogenous substances	10.97
Fatty matters	1.95
Sugar.	3.88
Gum	7.13
Starch	58.73
Woody fibre	1.62
Ash.	1.48

As above stated, rye generally, has a grayish brown color, but upon closer examination it will be found, however, that the color varies from yellow to brown, and that on some grains a bluish green coloration may be observed. These differences in color are still more apparent when the outer layers of cells are removed from the grain.

If these blue-green portions are cut into thin sections and placed under the microscope, it will be seen that some of the gluten cells have an intense blue color. The blue color is brighter, if the sections are placed in glycerine instead of water. The blue does not extend over the whole layer of gluten cells, but is limited to small groups, or even single cells, while the adjacent cells are perfectly colorless. Dilute hydrochloric or sulphuric acid changes the color to red. An addition of dilute potash solution turns it yellow. A number of grains, showing this coloration, when rubbed up in a mortar, and sifted to remove the flour, leaves a bran, which when treated with alcohol containing hydrochloric acid (70 per cent. alcohol with 5 per cent. hydrochloric acid) gives a beautiful rose-red solution.

The appearance of these blue gluten cells in rye appears to be of very common occurrence.

This grain, to which so many human beings are indebted for aliment, is subject to a disease, which, when it occurs, not only deprives it of all its useful properties as food, but renders it absolutely useless, and it may even be said, poisonous to man. When thus diseased it is called by English farmers *horned rye*, and by the French *ergot*, from the fancied resemblance to a cock's spur, of an excrescence which the grain then bears. Whenever this disease has been witnessed, it has usually happened that a wet spring has been succeeded by a more than ordinarily hot summer.

According to *Tissot*, the celebrated French naturalist, this excrescence, just mentioned, is an irregular vegetatation, which springs from the middle substance, between the grain and the leaf growing to the length of an inch and a half, and being two-tenths of an inch broad. It is of a brownish color.

Bread which is made of rye thus diseased has an acid and nauseous taste, and its use is followed by spasmodic symptoms and gangrenous disorders.

Test for Ergot.—Laneau renders the paste of the flour alkaline, adds dilute nitric acid to slight excess and then neutralizes, when a violet-red color will appear if ergot be present, which changes to rosy-red when nitric acid, and violet when alkali is added. Another test is the odor of propylamin developed on the addition of liquor potassæ to the ergotised flour.

[In our next number the milling of rye will be considered.]

COMPARATIVE RYE MILLING WITH ROLLS AND STONES.

BY LOUIS GRAF.

The subject of these tests was to grind a lot of fine rye flour, free from bran, first with rolls, then with rolls and stones and finally, exclusively with stones. 100 cwt. of French rye were used in each test:

First test—(*Schrotwalzen, Ausmahlwalzen, Schtalengang.*)

Arrangement: A large Braun roller construsted by Escher, Wyss & Co., with *Abzug, cylinder, Mehlcylinder,* (silk gauze Nos, 13 and 14,) *Dunstfach;* in addition to this a 2-paired porcelain roll with sorting machine and *Abzugcylinder* (silk gauze Nos. 14, 15, 8 and 4.

1. Performance of the *Schrotstuhl*, 10,000 lbs. gave by six successful breaks 1,513 lbs. of very fine white flour; 7,004 lbs. of middlings—working time, thirty-five hours.

2. Performance of the sizing porcelain mill.—The middlings to fine middlings (7,004 lbs. in nineteen hours) gave 1,675 lbs. of flour of excellent quality.

The *Ausmahlen* of the fine middlings on these rolls required 80 hours, and gave 3,396 lbs. of flour. The *Abgezogenen Schalen* (removed hulls) had to be ground out in one *Gang* (operation,) and gave 301 lbs. of very white flour. Working time, 10 hours; total production of flour, 6,975 lbs. *i. e.*, very nearly 70 per cent.; time required on breaking mill, 35 hours, sizing mill, 19 and 80; *Schalengang*, 10, total, 144 hours.

Second Test.—Breaking mill and *Mahlgang.*) Arrangement: A large Braun mill; with *Abzug* and *Mehlcylinder* (silk gauze, 13, 14 and 8,) a *Semmelgang*, with sorting machine. A *Schalengang*, with cylinder.

1. Performance of the breaking mill; 10,000 lbs. of rye, same quality as above, gave with three successive breaks, 1,232 lbs. of very light white flour, 5,508 lbs. coarse and fine middlings. Time, 29 hours.

2. Performance of the *Semmelgang*; 5,508 lbs. of middlings to 2,177 lbs. of light, pure flour, through sorting machine with silk gauze Nos. 13 and 14. Time, 15 hours.

3. Performance of the *Ausmahlgang*: Through sorting machine in 30 hours, 2,593 lbs. flour. *Schalengang* through cylinder (gauze 13 and 14) in 31 hours, 1,301 lbs. of very white flour. Total production of flour, 7,033 lbs. (fully 70 per cent.;) total time required, 105 hours.

Third Test (stone only.)—10,000 lbs of rye on a *Flachmalgang*. Stones were French from the works of A. Ehresmann, in Kaiserslautern.

Arrangement: A French *Gang* 1.30 metres in diameter, sorting machine with *Griesabzug*. One passing through of the grain in twenty-two hours gave 4,872 lbs. of very light, pure flour. On the same *Gang*, *ausmahlen* of the fine middlings (twenty-six hours,) and the *Schalen* in twenty hours. Total production of flour, 6,965 lbs. (fully 69½ per cent.) Total time required, sixty-eight hours.

It will be seen from the above that rolls alone are not well adapted to the grinding of rye. The whole milling process in the three tests was systematically performed, and the use of power was divided as equally as possible. Moreover, I have repeatedly made these tests, and always with the same results. In grinding wheat, with which I have also made some experiments, the results are altogether different. The only proper method for wheat milling, however, is to sort much and cleanse well.—*Die Muhle.*

A MEDAL WON.

[To the Editor of the United States Miller.]

SIR: We inclose you herewith a copy of the official report concerning our exhibit at the Southern Exposition, Louisville. We will appreciate the favor, if you will notice.

Yours truly,
NORDYKE & MARMON CO.

(Copy.)

The Southern Exposition at Louisville, Ky., 1883.

The board of directors has confirmed the following report of the jurors of awards for the Southern Exposition of 1883, and decreed an award in conformity therewith as follows:

REPORT OF AWARDS.

Product, Mill Machinery.
Exhibitor, Nordyke & Marmon Co., Indianapolis, Ind.
Award, A Medal, for the best display of flour mill machinery.

The award, as made above, is now in the hands of the engraver, and will be delivered as soon as completed.

J. N. Wright, General Manager.
Louisville, Ky., Nov. 26, 1883.

ABSORPTION OF MOISTURE BY GRAIN.

The claim that grain absorbs moisture enough on a sea voyage to pay the freight charges has been verified by some test experiments made at the California agricultural college. Various kinds of grains were placed in a moist atmosphere and the increase in weight was noted.

The greatest increase was during the first twenty-four hours, the absorption being nearly 33 per cent. of the total absorbed during the fifteen days' exposure. The following table shows the figures:

	First. 24 hours.	Totals. in 15 days.
Oats	2.79 per cent.	7.20 per cent.
Barley.....	1.45 per cent.	7.00 per cent.
Wheat.....	2.44 per cent.	6.56 per cent.

From the results obtained it was computed that perfectly dry grain 65° Fah. would absorb as follows: Oats, 29.08 per cent; barley, 28.17 per cent.; wheat, 25.01 per cent. Under ordinary conditions the percentage is perhaps not so high, 15 to 16 per cent. probably being the average.

RULES, PROBLEMS AND SOLUTIONS.

BY T. C. ALCOTT, MT. HOLLY, N. J.

Proportion of Tooth of Gear.

From pitch line to top of tooth,....Pitch,		x 0.33
Total depth of tooth,.....	"	x 0.75
Thickness of tooth on pitch line,..	"	x 0.45
Space between teeth on pitch line,	"	x 0.55
Ordinary width of teeth,.....	"	x 2.50

To Set Out a Right Angle.

Take 40 links on the chain line, 30 links for the perpendicular, and 50 for the hypothenuse.

In setting a wall or frame, measure off from the corner 6 feet on one side and 8 feet on the other, and make the distance between the two points just 10 feet.

One acre of surface contains 43,560 square feet; applied to a mill pond, or reservoir, that is the number of cubic feet in each acre, for every one foot of depth.

The pressure of water in a vessel or flume depends only upon the perpendicular height.

The pressure of water in pounds upon every square inch of the surface of the cistern, flume or pipe confining it, is exactly equal to the weight of a column of water one inch square, extending perpendicularly from a given point to the surface of the water in the flume or cistern.

The velocity of water spouting from an orifice under the pressure of a perpendicular column of water is eight times the square root of the height of the head.

The quantity of water discharged through an orifice of given size, varies as the square root of the head.

The power varies as the square root of the head multiplied by the head.

The revolutions of a turbine vary as the square root of the head divided by the diameter of the wheel in feet.

To ascertain the cubic feet per minute that will discharge through an opening or spout, theoretically, multiply the area of the opening in feet by the square root of the head; multiply the product by 8, and that product by 60.

If the opening be cut in a thin metal plate placed in the perpendicular side of a flume or reservoir, the quantity of water discharged will be only five-eights of the theoretic, as computed by this rule.

Rule for Finding the Length of Belt Wanted:

Add the diameters of the two pulleys together, divide the result by two, and multiply the quotient by three and one-fourth. Add the product to twice the distance between the centres of the shafts, and you will have the length required.

Rule for Finding the Change Required in the Length of Belt when one of the Pulleys on which it Runs is Changed for One of a Different Size:

Take three times half the difference between the diameters of the pulleys, and the result will be the length of belt to cut out or put in.

To Find the Width of Belt to Transmit a given Horse-Power:

Multiply 36,000 by the horse-power. Multiply the speed of the belt in feet per minute by one-half the length in inches of belt contact, with smaller pulley. Divide the first product by the second. The quotient will be the width of belt in inches.

To Find the Horse-Power a Belt will Transmit:

Divide the square inches of belt contact with smaller pulley by two; multiply this quotient by the velocity of belt in feet per minute and divide by 36,000.

To Measure Belting in the Roll.

The length of belt (in feet) equals the sum of the diameters of the roll and eye (in inches) multiplied by the number of turns in the roll and this product multiplied by the decimal .1309.

In putting on a new belt or taking up an old one, great care should be taken to have the ends perfectly square, and the lace or hook holes punched exactly opposite to each other. Many fail in these respects and in consequence have crooked belts.

Belts should never be oiled except when they become dry and hard, and then the oil should be used very sparingly. Oil not only rots the leather, but causes the belt to stretch. Lukewarm tallow is advised for oiling by excellent authority. It is well to add resin when belts run in damp places.

It is false economy to use as narrow and short belts as possible in order to save expense. The small amount saved is lost many times over by stoppage of machinery, slipping of bands, extra strain on shafting and an increased amount of friction, requiring additional driving power, and causing the more rapid wear of belts.

The comparative driving power of different belts is about as follows:

Leather, grain or smooth side to pulley,	...31
Leather, flesh side to pulley,	28
Rubber,	21
Gutta Percha,	14
Canvas,	11

Stretching the belt over pulleys too tightly is apt to cause the lace holes to tear out. The more thoroughly stretched the belt is when made, the more likely it is to tear when subjected to undue strain. A belt not properly stretched in the process of manufacture will yield readily when tightened over pulleys and used, thus relieving itself of the extra strain above what should be put upon it.

Belt studs are preferable to lacing, in that they do not require any portion of the belt to be cut away for their insertion. Frequently the width of a belt is virtually reduced one-quarter by the cutting of holes in lacing.

To Find the Circumference of a Circle when the Diameter is Given:

Multiply the diameter by 22, and divide the product by 7; or multiply the diameter by 355, and divide the product by 113.

To Compute the Diameter of a Circle or of a Pulley:

Divide the circumference by 3.1416; or multiply the circumference by .3183; or as 22 is to 7 so is the circumference to the diameter.

To Compute the Area of a Circle:

Multiply the circumference by one-quarter the diameter; or multiply the square of the diameter by .7854; or multiply the square of the circumference by .07958; or multiply half the circumference by half the diameter; or multiply the square of half the diameter by 3.1416.

To Find the Surface of a Sphere or Globe:

Multiply the diameter by the circumference; or multiply the square of the diameter by 3.1416; or multiply four times the square of the radius by 3.1416.

To Compute the Diameter of a Toothed Wheel.

When number of teeth and pitch are given, multiply the number of teeth by the pitch and by 32, which will give diameter at pitch line. For explanation, take a wheel of 80 teeth, 2½ pitch:—80x2½=200x32=64.00 in diameter.

To Compute the Number of Teeth in a Pinion to have any given Velocity:

Multiply the velocity or number of revolutions of the driver by its number of teeth or its diameter, and divide the product by the desired number of revolutions of the pinion or driver.

To Compute the Diameter of a Pinion, when the Diameter of the Driver, and the number of Teeth in Driver and Pinion are given:

Multiply the diameter of driver by the number of teeth in the pinion, and divide the product by the number of teeth in the driver, and the quotient will be the diameter of pinion.

To Compute the Number of Revolutions of a Pinion or Driver, when the Number of Revolutions of Driver, and the Diameter or the Number of Teeth of Driver and Driven are Given:

Multiply the number of revolutions of driver by its number of teeth or its diameter, and divide the product by the number of teeth or diameter of driven.

To ascertain the Number of Revolutions of a Driver, when the Revolutions of Driven and Teeth or Diameter of Driver and Driven are given:

Multiply the number of teeth or the diameter of driven by its revolutions, and divide the product by the number of teeth or diameter of driver.

To ascertain the Number of Revolutions of the last Wheel at the end of a Train of Spur Wheels all of which are in a line and mesh into one another, when the Revolutions of the first Wheel and number of Teeth on the Diameter of first and last are given:

Multiply the revolutions of first wheel by its number of teeth or its diameter, and divide the product by the number of teeth or the diameter of the last wheel; the result is its number of revolutions.

To ascertain the number of Teeth in each Wheel for a Train of Spur Wheels, each to have a given Velocity:

Multiply the number of revolutions of the driving wheel by its number of teeth, and divide the product by the number of revolutions each wheel is to make, to ascertain the number of teeth required for each.

To Compute the Number of Revolutions of the last Wheel in a Train of Wheels and Pinions, Spurs or Bevels, when the Revolutions of the first or Driver, and the Diameter, the Teeth, or the Circumference of all the Drivers and Pinions are given:

Multiply the diameter, the circumference or the number of teeth of all the driving wheels together, and this continued product by the number of revolutions of the first wheel, and divide this product by the continued product of the diameter, the circumference or the number of teeth of all the pinions, and the quotient will be number of the revolutions of the last wheel. Example:—If the diameters, the circumferences, or the number of teeth of a train of wheels are 8, 8, 10, 12, and 6, and the diameters, circumferences, or number of teeth of the pinions are 4, 5, 5, 5, and 6, and the driver have ten revolutions, what will be the number of revolutions for the last pinion? Multiply all the drivers together and then by 10 revolutions, and you have 8 by 8 by 10 by 12 by 6 by 10, equal to 460800; divide this amount by the product of the figures for pinions, 4 by 5 by 5 by 5 by 6=3000, and the quotient will be 153 or the number of revolutions of last wheel. This rule is equally applicable to a train of pulleys, the given elements being the diameter and the circumference.

To find the Horse-power that the Teeth of a Wheel will Transmit:

Multiply the square of the pitch in inches, by the velocity of the pitch line in feet per second, multiply the product by the breadth of teeth in inches, and divide by 16·

To determine the Diameter of a pair of Wheels in contact with each other, their Velocity and the Distance of their Centres apart being given:

Divide the greatest velocity by the least; the quotient is the ratio of diameter the wheels must bear to each other. Hence divide the distance between the centres by the ratio, plus 1—the quotient equals the radius of the smaller wheel—and subtract the radius thus obtained from the distance between the centres; the remainder equals the radius of the other.

ENGINES AS HELPERS FOR WATER-WHEELS.

"How not to do it" might well be written upon an important part of the combinations of fixtures, gearing, shafting, and pillow-blocks, by which engines are sometimes attached to water-wheels, nominally with a view of helping them, but really with the effect of piling upon the joint effort of the combination an excess of load absurdly above the limit which need have been involved. In these days, when compact engines, of high rates of economy, can be had in small and medium sizes, and when hard brick and the strongest cements can be had with which to build a strong foundation, or, if need be, a slender-braced pier, it is a gross wrong thus to encumber any mill premises, or to saddle upon a declining water power, or upon a high-priced coal supply, the burden due to the use at high speed of the complex trains which have sometimes been put into mills. Of some of these it is hard to believe that they were designed for the purpose of a real helping from a single central and large engine several water-wheels which are placed at considerable distances from each other and run at different speeds, and, still farther, may need to be disconnected separately from the combination.

The real test of skill and good judgment in making such a connection is shown rather in the rigid simplicity of parts which can be contrived for the combination, and not by the use, which is sometimes seen, of two or even three times the number of pieces that need be put in. So long as it is a scanty water power which must be helped out the plain course would seem to be to add in the permanent fixtures, to be used only when the water had become the hardest to get, the very least possible load, for not only must the fraction of the current work of the mill due to the loss of water be thrown upon the engine, but also the load due to the friction and other losses arising from the employment of the engine. The use of two or three small engines, one at each wheel, instead of one larger, central engine, leads without doubt to a greater loss from friction in the engine parts, and to some greater cost in the use of the steam, but any probable sum of all these losses, if the arrangement be skilfully made of separate engines, will be very much less than that due to the combination of gearing for which some of the designers of such fixtures seem to have an extraordinary and altogether an accountable liking.

Many of these men, who would seem to be incredulous as to the possibility of putting an engine into the under-floor spaces devoted to water-wheels, would find some useful hints in the arrangements of parts on first-class ocean steamers, in which spaces are utilized to the last degree. No one would willingly crowd important machinery into a small space, but these ships probably show the best examples to be found of good ways in which such things can be done, and in which mill men would find it more to their advantage to do them than some seem prepared to believe.

HINTS ON PURIFYING.

The following advice, given by a well-known firm, is of value, and applies generally;

The spout leading to dust-room must not be smaller than the opening of the fan-trunk of the purifier, and when changes of direction are necessary in this spout they must be made on a curve instead of at an angle.

The fan case may be taken out and reversed, so that the fan will discharge toward the head of the machine, if desired.

See that the machine is driven fully up to the speed at which it is rated to run.

Keep the silk on the sieve always stretched tight.

The speed at which the middlings flow along the cloth may be varied by changing the pitch of the hangers which suspend the shaker frame, a rapid flow being obtained by setting them out of perpendicular toward the head of the machine.

As a rule no more pitch should be given these hangers than the least required to flow the stock.

Never use air enough to bubble the stock on the cloth, but make the currents as strong as possible without causing this action, and without carrying good stock to the dust-room.

Always load a machine as heavily as it is possible without making the tailings too rich. If necessary, let the purifier return to itself sufficiently to accomplish this end.

Cut off and return a few inches from the head of the machine to avoid specks.

On extremely coarse middlings, if very strong air currents are desired, increase the speed of the fan by decreasing the diameter of the pulley on fan shaft.

Great care should be taken to have the middlings well dusted, for a purifier will certainly waste the flour thrown upon it. Three quarters of the samples of middlings sent us, especially from the smaller mills, are poorly dusted, many samples showing 25 per cent. of flour through a No. 14 cloth.

The exhaust from the dust-room should be at least three times the size of the spout leading from the fan to it.

THE MENASHA, WIS., MILL DAM CASE DECISION.

The Supreme Court of the United States has at last rendered a decision in the celebrated water suits, awarding damages for the ruining of a farm by reason of the water in the lake being raised by the Menasha dam, Judge Gilson and Geo. E. Sutherland, of Menasha, recently went to Washington to try the case, and the decision of the lower court has been affirmed. The suit was instituted in April, 1875, and was entitled, Frank L. Jones, administrator of the estate of George J. Pumpelly, James K. Pumpelly and Edwin Z. Gray vs. the United States. It was claimed that the Menasha dam so raised the water in Lake Winnebago that the Pumpelly farm, since known as the Gray farm in Taycheedah, a short distance from Menasha, was made worthless. This was not done by actual overflowage, but the land was so low that the high water came within a few inches of the surface, and made the farm cold, wet and practically worthless. The case was first tried by Commissioners who awarded plaintiffs $8,000 damages, R. L. D. Potter, of Wautoma, special counsel, appearing for the Government. The latter appealed the case to the Circuit Court of the county, where it was tried by Judge McLain. The jury rendered a verdict of $10,000 damages. The Government then took the case to the Supreme Court of Wisconsin, and O. B. Thomas, of Prairie du Chien, appeared for the appellant. The decision of the Circuit Court was affirmed. The case was then taken before the Supreme Court of the United States on a writ of error, and the decision affirmed, the Government being represented by Solicitor-General Philips. The verdict in the Circuit Court was rendered in 1878, and the present judgment is for $10,000 with interest since that time. The judgment is the property of Dr. Gray.

This case settles forever the liability of the the Government for the thousands of acres of ruined farm lands in this State, that were made worthless by dams. Mr. Sutherland has in his hands seventy cases of the same kind, arising from the Appleton, Menasha and Montello dams, and he says that the only remaining points in them concern the amount of damages and the statute of limitation. The remaining difficulty is to collect a judgment against the Government.

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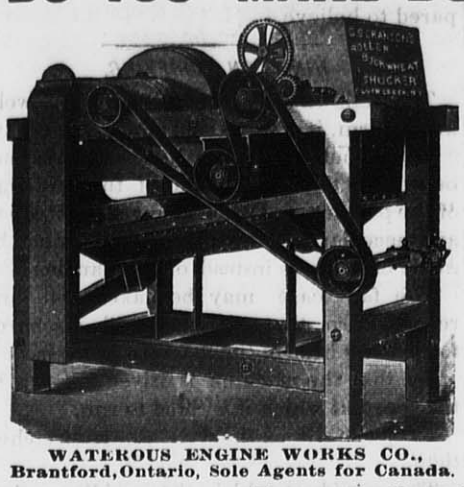

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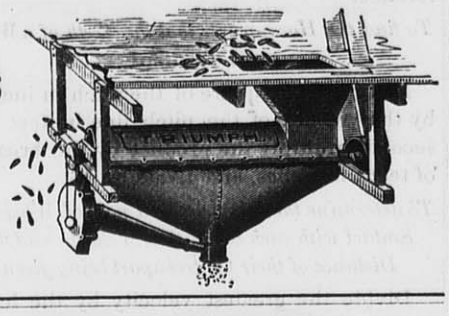

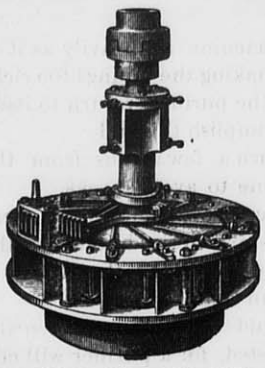

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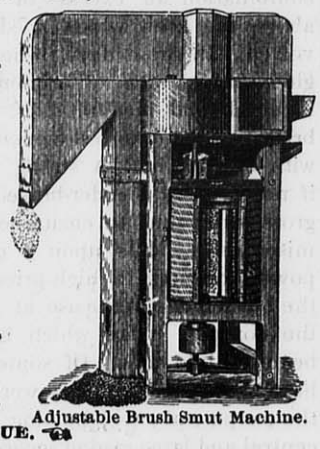

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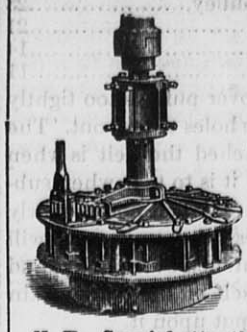

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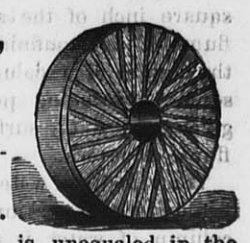

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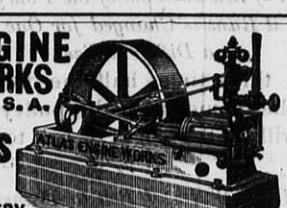

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TRICKS ON INSPECTORS.

We have in these pages indulged in a few remarks upon the vagaries of inspectors, and the stringency and unsatisfactory character of engineering specifications. But our readers are no doubt fully aware that there is another side to the question—that if the engineer and inspector try to secure more than a fair share of the bargain, the contractor, on the other hand, frequently studies how he may outwit the engineer, drive a coach-and-four through his specification, and hoodwink his inspector. The contractor is a great deal like other men, or, as Artemus Ward says, "has a good deal of human nature in him." The ultra sharpness of an inspector frequently overreaches itself, leading the contractor and his employes to set their wits to work to defeat any extra or unfair inspection. It has been pithily observed that there are tricks in all trades, and certainly the mechanical engineering trade is no exception to the saying.

The following are instances in which tricks have been played upon inspectors which have come under the writer's notice, and which, no doubt, some of our readers could supplement by others in their experience. The first instance is where an inspector, in a rolling mill, was gauging a quantity of iron bar. Steel gauges had been carefully made of the exact sizes of the iron required. When the inspector came to try them on the iron, he found the iron full to size; the gauges would not go on the iron. After bullying the foreman and men all round, vowing he would reject the iron, he rushes off to the office to see the manager, as a preliminary to rejection. Presently up came the manager and inspector in earnest conversation. "What is the matter with the iron?" says the manager. "It is too large; the gauges won't go on," says the inspector. He tries the iron again, the gauge pass on admirably, and he is dumbfounded; he tries bar after bar, they are exact to the size, the iron is passed and shipped off to its destination, and no more is heard of it. The secret of this transformation was that the foreman was busy as well as the inspector. Whilst the latter was on his visit to the manager's office, he (the foreman) had set a fitter to file the gauges until they would comfortably fit the iron, the unfortunate inspector having inadvertently left his gauges on the iron; of course a careful watch being kept for the return of the inspector. This *chef d'ouvre* is look upon as a good joke in the works, and to this day is related with great glee.

The next case which occurs to us was where the iron was under size in a bridge building works. The whole being a lump sum job, the iron had been ordered light. Mr. Inspector appears on the scene, with a brand new pair of callipers out of a neat leather case. He carefully measures bar after bar, and finds them rather under the specified dimensions, and accordingly rejects them. They are taken into the stores and a few coats of paint given them, when they are brought out again to be used on the job. This time they are callipered and found over size, and accordingly are passed. A usual trick with workmen in cases of this kind is to order a few bars of the correct thickness and work the thin ones in amongst them, taking care, ostentatiously, to solicit measurements on the bars known to be up to the proper size.

Another trick which has come under our notice is one in which certain holes had been bored in error, larger than were required in the tie-bars of a Warren girder bridge; of course they were rejected. Advantages was taken of a temporary absence on the part of the inspector to carefully bush the holes with iron bushes, hammer them well, and carefully paint the work. Needless to say, everything passed off satisfactorily.

A commonplace trick in the workshop is, when there is a bad place in a plate of a girder, or a panel of a railway carriage, to promiscuously hang a workman's coat on a convenient bolt which will cover the defect. In nine cases out of ten the defect will not be discovered.

Among other dodges played on an inspector is one where he had rejected a quantity of iron. He privately marked the ends with a center punch. This was discovered. Nothing was said at the time, but the next lot of iron that came into the yard was marked with a center punch at each end of the bar. The inspector challenged the iron, declared that it had been rejected. The foreman used strong language, and said the punch marks were their own marks put there for identifying the iron for that job, and made counter declarations that it had not been tested. Test pieces were taken and found to stand well, and there was no course open but to pass the iron; the rejected iron, of course, finding its way into the heap that had been passed.

At one works that we know, a place is reserved for the inspector to examine close to a canal, so that when the ends of any bars are bad they project over the canal, and can not be examined except at the one end without entering a boat on the canal, which is not often convenient to obtain, the result being that many tons are allowed which ought to be rejected.

But it is not alone in the preliminary stages of manufacture that tricks are played upon the inspector. We have known instances where, in testing the deflection of a roof when the staging has been taken away, the contractor's foreman has held the line with a plumb-bob at the top of the arch, and has carefully pulled the string up a trifle to reduce the deflection. In the manufacture of castings it is very usual to stop the holes in a defective casting by a cement known as "beaumotague," before the inspector can examine them. Again, it is not infrequent that the test bars employed for testing the quality of iron in a set of castings are from a different melting, or even a different cupola, to that from which the castings have been made; naturally, such test bars are not inferior in quality to the castings. A very big hole in the bed-plate of a lathe we have known made good with a lump of putty carefully smoothed down and painted with the universal lead color used to finish machinery. Perhaps one of the most barefaced tricks ever played upon an inspector was where a quantity of sheet-iron water barrels had to be tested with a specified head of water. The pipe was erected to the height required, and the outlet from the barrel allowed the water to rise to the required head and then to run to waste, flowing off in a stream whilst the barrel was under the test. This inspector had been particularly troublesome; and one of the workmen whose wages were effected, conceived the idea of circumventing him, which he did by quietly making one evening a short shunt between the inlet and outlet pipes, without the water passing through the barrel. The latter being previously filled, the cocks were turned on, and the pressure-pump set to work, but not a barrel leaked or a rivet sweated, whilst the inspector sat watching the water flowing from the outlet pipe. Needless to say all the barrels passed the test, only now and then, for the sake of appearances, the full pressure was allowed to be put on to a barrel, the others being tested by being simply filled and the water pumped through the short shunt. A similar trick we have known of in testing boilers. The pressure is put on the pump, and it merely passes through a pipe in the boiler to the gauge on the steam dome; it does not press the boiler, and the latter was naturally "as tight as a bottle." A particularly green inspector thought he would prevent this trick being played upon him. He, therefore, had two pieces of stout string tied around the boiler transversely and longitudinally respectively. When this feat was accomplished, he triumphantly exclaimed: "Now then, put on the pressure." Poor fellow? he had forgotten that the elasticity of the string exceeded that of the boiler, and he could detect no difference of measurement in the length of the string before or after the test. Had he fixed a wooden plug in the top part of the boiler, and had it knocked out whilst under pressure, he would have found that a stream of water would have shot up to a height nearly corresponding to the equivalent head of water, and a volume of water ejected corresponding to the increasing volume of the boiler under pressure.

The lesson that may be learnt from these tricks is, that it is impossible to be up to all the arts that an unprincipled contractor can employ, and that it is far better to go to a respectable firm for work and machinery, who have a reputation to lose and a character at stake. At the same time it is nearly enough to make us acquiesce in the most severe clauses of a strict specification, and we may take it as certain that whilst the system of unlimited competition reigns, such expedients as we have narrated will be carried on in spite of the most stringent of specifications or the sharpest of inspectors.—*Manchester World*, (*Manchester, England.*)

The town of Columbus, in Colorado county, Texas, is situated at the opening of a remarkable horse-shoe bend of the Colorado river. The river comes up to the town on the north side and then wanders away fifteen miles, returning at last to the southern side of the town only a thousand yards from the point where it started off on its long detour. The fall in the neck of land between these two points is 17 feet, by careful measurement. What an immenae water power could here be so easily obtained. The soil at the neck is sand, gravel and clay, so that there would be no difficulty whatever in the way of procuring this great water power; it is one of the easiest positions imaginable.

THE GEORGIA SUPREME COURT ON FUTURES.

The Supreme Court of Georgia has rendered a decision which shows that that judicial body is down on dealing in futures. The case in which the decision was rendered was an appeal from the Richmond Superior Court. It was that of the National Exchange Bank of Augusta, against Robert E. Cunningham. Cunningham gave his note to Warren, Wallace & Co., cotton dealers, of Augusta, who transferred it to the bank. Payment was refused, and the bank brought suit. The plea was that the note was given as part of a future contract. In delivering his opinion justice Brandford said :

"If this is not speculating on chances, wagering and betting between parties, then we are unable to understand the transaction. A betting on a game of faro, brag or poker cannot be more hazardous, dangerous or uncertain. Indeed, it may be said that these animals are tame, gentle and submissive compared to this monster. The law has caged them and driven them to their dens; they have been outlawed, while this ferocious beast has been allowed to stalk about in open midday with gilded signs and flaming advertisements to lure the unhappy victim to its embrace of death and destruction."

The business of selling and buying cotton futures has grown in spite of persistent opposition from the pulpit, legislative halls and bench, in enormous proportions. Now and then bucket shops have received a rebuff when they sought to enforce their contracts directly, but they have managed to avoid this to a considerable extent by taking negotiable notes and transferring them to innocent holders, in whose hands it was supposed they were good. The Supreme Court struck a crushing blow against this entire system of speculation, holding that the whole business was a vast gambling scheme; that all contracts or notes based on futures were gambling contracts and absolutely void, and they were not good even in the hands of an innocent purchaser.

KING CORN.

When gold was first discovered in Capt. Sutter's mill-race, in California, Edward Everett asserted at a dinner given in Boston by the U. S. Agricultural Society that corn was a gold more valuable than those taken from the diggings. Drop a grain of California gold, said he, into the ground, and there it will lie unchanged to the end of time. Drop a grain of golden corn into the ground in the spring time, and in a few days it is a living thing, which produces one if not two ears, each of which is studded with hundreds of grains of gold, every one possessing the same wonderful properties as the parent stalk. A grain produces over two thousand grains the first year, and if each one of these is in turn planted, we have upwards of six thousand ears the second.

Mr. Everett admitted that miserly old fogies might say that if one crop only of gold can be gathered from the same spot, it lasts to the end of time, while golden corn is produced only to be consumed, and when consumed, is gone forever. This, said Mr. Everett, is a most egregious error both ways. It is true that California gold will last forever unchanged, if its owner chooses, but while it so lasts it is of no use, no, not as much as its value in pig iron, which makes the best of ballast; whereas gold, while it is gold, is good for little or nothing. You can neither eat it, nor drink it, nor smoke it. You can neither wear it, nor burn it as fuel, nor build a house with it; it is really useless till you exchange it for consumable, perishable goods; and the more plentiful it is, the less its exchangeable value.

Then he eloquently described Indian corn. To-day a senseless plant; to-morrow it is human bone and muscle, vein and artery, sinew and nerve, beating pulse, heaving lungs. toiling, ah, sometimes overtoiling brain, Last June it sucked from the cold breast of the earth the watery nourishment of its distending sap-vessels, and now it clothes the manly form with warm, cordial flesh; quivers and thrills with the five-fold mystery of sense, purveys and ministers to the higher mystery of thought. Heaped up in your granaries this week, the next it will strike in the stalwart arm and glow in the blushing cheek and flash in the beaming eye; till we learn at last to realize that the slender stalk which we have seen shaken by the summer breeze, bending in the corn-field under the yellow burden of harvest, is indeed the "staff of life," which, since the world begun, has supported the toiling, struggling myriads of humanity, on the mighty pilgrimage of being.

But I do not know that it is neccessary to use even Mr. Everett's eloquent words to convince every farmer of the importance of the corn crop. The speculators said that the early frost had injured it in some sections, but the total yield is estimated in the October Report of the Bureau of Agriculture at 1,600,000,000 bushels. Just think of that. One thousand six hundred million bushels of corn against 430,000,000 bushels of wheat, 500,000,000 bushels of oats and 50,000,000 bushels of barley.—*Ben Perley Poore, in American Cultivator.*

TESTING BOILERS.

A writer in the Cincinnati *Artisan* adds his testimony as to the inefficiency of the hydraulic test in examining steam boilers as follows: This test is only valuable in bringing to notice defects which would escape ordinary inspection. It is not to be assumed that it in any way assures good workmanship or material, or good design, or proper proportions; it simply shows that the boiler being tested is able to withstand this pressure without leaking joints or distorting the shell to an injurious degree,

Bad workmanship may often be detected at a glance by an experienced person. The material must be judged by the tensile strength and ductility of the sample tested; the design and proportions to be judged on constructive grounds, and have little or nothing in common with the hydraulic test.

The great majority of buyers of steam boilers have but little knowledge on the subject of tests. and too often conclude that if they have a certified copy of a record showing that a particular boiler withstood a test of say 150 pounds, it is a good and safe boiler at 75 to 100 pounds steam pressure. If the boiler is a new one and by a reputable maker, that may be true; if it has been in use and put upon the market as a second hand boiler, it may be anything but safe at half the pressure named. By the hydraulic test, the braces in a boiler may be broken, joints strained so as to make them leak, bolts or pins may be sheared off or so distorted as to be of little or no service in resisting pressure when steam is on.

The practice of inspecting boilers by sounding with a hand hammer is in many respects to be commended. It requires some practical experience in order to detect blisters and the wasting of plates, by sound alone. The hammer is especially applicable to the thorough inspection of old boilers.

It frequently happens in making a test that a blow of the hand hammer will either distort it or be driven entirely through the plate; and it is just here that the superiority of this method of testing, over or in connection with the hydraulic test, becomes fully apparent. The writer once knew a locomotive which had been run into the repair shops for some slight repairs; and afterwards was subjected to the usual hydraulic test and was found to be tight; it was then run into the round house for service, but before it was fired it was accidentally discovered by a boy's "fooling" around the fire box with a hand hammer that the plates which were originally five-sixteenths inch thick had been reduced in some places by corrosion to a thickness scarcely more than one-sixteenth inch. This incident is introduced by way of a digression simply to show the value of the hammer test and the insufficiency of a hydraulic test in the case of boilers which have been some time in service.

The location of stays, joints, and boiler fittings all modify, and are apt to mislead the inspector if he depends upon sound alone. There is a certain spring of the hammer, and a clear ring indicative of sound plates, which are wanting in plates much corroded or blistered. The presence of scale on the inside of the boiler has a modifying action on the sound of the plate. When a supposed defect is discovered, a hole should be drilled through the sheet, by which its thickness may be determined as well as its condition.

The literature of boiler explosions is by no means scanty, and varies anywhere from sound practical experience to the most visionary idealism; but those who have most to do with steam boilers, and whose business it is to trace results to causes, are singularly unanimous in the opinion that almost without exception boiler explosions may be traced directly back to the causes—overpressure and neglect.

THE REMORSEFUL CAKES.

A little boy named Thomas, ate
Hot buckwheat cakes for tea—
A very rash proceeding, as
We presently shall see.

He went to bed at 8 o'clock,
As all good children do,
But scarce had closed his little eyes,
When he most restless grew

He flopped on this side, then on that,
Then keeled up on his head,
And covered, all at once, each spot
Of his wee trundle bed.

He wrapped one leg around his waist
And t'other round his ear,
While mamma wondered what on earth
Could ail her little dear.

But sound he slept, and as he slept
He dreamt an awful dream,
Of being spanked with hickory slabs
Without the power to scream.

He dreamt a great big lion came
And ripped and raved and roared—
While on his breast, two furious bulls
In mortal combat gored.

He dreamt he heard the flop of wings
Within the chimney flue—
And down there crawled to gnaw his ears,
An awful bugaboo!

When Thomas rose next morn, his face
Was pallid as a sheet—
"I never more," he firmly said,
"Will cakes for supper eat!"

—*Eugene Field.*

GRADING THE WHEAT.

AN IMPORTANT LETTER FROM MR. CHAS. A. PILLSBURY.

[From The Tribune, Minneapolis.]

The question of the grading of wheat, the prices paid for it and the relations of the miller and farmer have been discussed repeatedly in these columns. The main facts of the controversy never vary and are familiar to all. The farmers claim that at the elevators their wheat is graded down and that they are not paid a fair market price for it. On the other hand the millers claim that the grades established here are in every way more advantageous than those in Milwaukee and Chicago and that the price of wheat is, as a rule, higher here than in those cities, the cost of transportation being considered. Messrs. Chas. A. Pillsbury & Co., besides owning the largest milling establishment in the world, also control the most extended and complete system of elevators. Hence the truth or falsity of the statements made by farmers and others are peculiarly of interest to them and their knowledge of the situation must always command respect. The following letter from Mr. Chas. A. Pillsbury to General Manager Manvel of the Manitoba railroad, on this subject, will be read with great interest:

MINNEAPOLIS, Minn., Dec. 14, 1883.—A. Manvel, General Manager St. Paul, Minneapolis & Manitoba Railroad, St. Paul, Minn. —DEAR SIR:—In accordance with your request to put in writing the statements made to you during our conversation, Nov. 27, I beg to submit the following: As long as the complaints about wheat grading, and the prices for wheat which are being paid to the farmers were confined to politicians who were trying to make capital out of the people, and to ignorant persons who did not know what they were talking about. I did not consider the matter worthy of attention. I think you will acknowledge that we have thoroughly investigated any alleged wrongs and have invariably corrected any abuses that have been discovered in the workings of our elevator system on your line. But, as these complaints seem to be giving you annoyance, I wish to do everything in my power to stop them as far as their being retailed by honest people is concerned. I recognize the fact that the railway company, the elevator company, the millers and all other manufacturing and mercantile enterprises are deeply interested in having the farmers of Minnesota and Dakota paid *the highest price possible* for their wheat, as a liberal and paying price produces the greatest prosperity and results in general good, which cannot come from any artificial diminution in prices. We have, we think, erected on your line, the finest system of elevators in the world, as regards character and capacity of the houses and we think that this, combined with the other elevators on your road make it the best equipped with elevator facilities of any road in the United States. But even with the enormous elevator capacity now existing on the Manitoba road and with your magnificent complement of rolling stock and engines, it has been difficult to meet the requirements of the country at certain points, owing to the large amount of grain that has been rapidly brought in at some stations, because of the exceptionally fine condition of the roads, and weather and from the large increase of acreage in crops directly contiguous thereto. To remedy this we contemplate making large additions to our storage room another season.

Personal examination and inquiry among the farmers has convinced me and my partner, Mr. Hurlburt, that but very few of the farmers will say that they have any cause for complaint against any of the elevators of our company, but certain interested parties are trying to persuade them that they are not getting proper grades and prices for their wheat. Now, as you well know, we do not make the standard for grades, the regular standard for Chicago and Milwaukee having been adopted by law, both in Minnesota and Dakota. Undoubtedly, as far as the price of wheat is concerned, the Minneapolis millers could pay what they chose, if they did not mind whether they made or lost money, but if they paid more than they could afford to, in a few years they would be driven out of the business, and then the farmers of the Northwest would be a great deal worse off than they imagine themselves to be now. As to grades, the Minneapolis Millers' Association has always offered to all parties shipping wheat to them in this market, that in case they were dissatisfied with their grades, that they would ship *the identical cars of wheat* to any other markets on their own account, provided, the parties would take the wheat off their hands in the market to which it was to be shipped, if the Minneapolis grades were not sustained. I do not see what can be fairer than this. But, substantially, the price of wheat is fixed by the leading markets of the world. The large surplus of this country eventually finds a market in Europe, at European prices. Now, in order to satisfy all reasonable complaints against the Pillsbury & Hulbert Elevator Company and against the Minneapolis millers, I make this proposition: That Gov. Hubbard, Railroad Commissioner Baker and yourself agree upon three competent and impartial men who shall spend a week or two examining the workings of our elevator system and learn just what grades and prices the farmers are, and have been getting. If these gentlemen are able to show you how, taking our houses as a whole, we could have done better in grades and prices, consistent with the legitimate and fair interests of everyone, I will cheerfully pay the expense of this investigation; but on the contrary, if they report what we have done substantially as well as could be expected of us under the circumstances, your road shall pay the cost of the investigation. It must be borne in mind that the grading of wheat is entirely a matter of judgment and that among the workings of 63 different men there must of necessity be cases of injustice to the farmers, but I think for every one case where wheat has been under-graded at our elevators we can show that there have been ten cases where it *has been over graded.*

One thing I know. Our elevators are constantly losing grades, and if any swindling is being done by our agents it is not being done for our benefit. If any of them are doing any dishonest work we want to know it. I will undertake to show that to the satisfaction of any fair minded man.

(1.) That the regular grades of wheat in Minneapolis are as liberal for the farmer as those of any leading market in the West, including Chicago, Milwaukee, Duluth and St. Paul.

(2.) That the Minneapolis millers, instead of trying to beat the farmers on grades, are continually taking wheat on grades that will not pass the regular inspection in these markets.

(3.) That taken as a whole the Pillsbury & Hulbert Elevator Company are giving and have been giving better grades in the country than they can dispose of their wheat at in Minneapolis, Duluth, St. Paul, Chicago or Milwaukee.

(4.) That the price paid by the Minneapolis millers, not only at present but for the past three years, have been all they could afford to pay, and that the average profit made by the millers of Minneapolis and vicinity in the past three years has been less than a reasonable manufacturing profit, considering the risks of the business and the large amount of capital employed.

I realize perfectly well that such a committee as I have suggested could find individual cases where appearances would indicate that the farmers were not receiving proper grades and consequently proper value for their wheat and cases where grading has been irregular, but we would gladly pay $10,000 a year salary, for an infallible judge of wheat. How, then, can we expect men getting not one tenth of that amount as a salary to be infallible on a question requiring so much judgment. I do not want this investigation confined to individual cases, as I have no doubt they can be found, but I wish it broad enough to show the general policy of our company. In short, I think I can show that any mistakes that have been made were only such errors of judgment as even the best of wheat men sometimes make and that they are not the result of any deliberate intention to defraud anyone. Our assertion is, that taken as a whole, we are doing as well as we could be expected to do and as well as we could afford to do, and that our elevators on your road are subjected not only to a fair and rigid oversight on the part of the elevator proprietors themselves, but that they are always subject to close scrutiny from the railway officials, whose aim it is to promptly report and correct any known abuses as you have the right under your lease to do. Furthermore, we think if such a committee would extend their investigation so as to learn what the farmers of Kansas, Iowa, Southern Minnesota and Dakota are getting for their wheat as compared with the farmers of northern Minnesota and Dakota they would agree that the latter *had a regular bonanza* compared with the former. You well know that our elevators are public elevators, and that any one can buy through them who has money to pay for wheat, on terms that only pay us a very moderate return for our investment, and that all the markets are wide open for anyone to buy wheat who wishes to. They can have their wheat shipped to Duluth, Minneapolis or any other market. As to the price of wheat, every reasonable man certainly knows that the Minneapolis millers are not responsible for it if it is considered low; indeed, were it not for these mills the price of wheat would be very much lower. While a few million bushels of wheat could be allowed to go perhaps to the Duluth market and bring as good prices as in Minneapolis, were the Minneapolis mills, with their enormous consumptive demand for wheat, to shut down, the amount of wheat that would have to go not only to Duluth, but also to Chicago and Milwaukee would have a depressing influence on those markets. The farmers of the Northwest should not forget that it is largely the milling improvements of Minneapolis which have made the settlement of the Red River valley possible, and that they reap a good share of the benefits conferred by the expensive machinery and skilled methods employed in this city. Before the perfection of these methods in Minneapolis, spring wheat sold as much as 30 and sometimes 40 cents per bushel below winter wheat, because with the then existing appliances for its reduction to flour its commercial value was greatly inferior to winter wheat; were it not for these improvements and for the milling industry which has grown up in Minneapolis and elsewhere in Minnesota, the same thing would be true to-day of the Red River valley, and wheat would net the farmer *a great deal less money* than it does now I will go further and say that were it not for these improvements, which have been adopted more or less elsewhere, the price of Minneapolis spring wheat to-day would not much more than pay the freight to Europe. I do not think any fair minded person will object to men receiving a fair reward for the work devoted to the development of the milling system. Nothing would delight us more than to pay the farmers of Minneapolis and Dakota more money for their wheat, provided we could get it back from our customers in the East and in Europe in the shape of correspondingly higher prices for flour, but we can truly say that in our experience of fifteen years in grinding Minnesota wheat we never sold flour as low as we are selling it to-day.

As a large proportion of our elevators are in Dakota, we make the same proposition in reference to an investigation by the commissioners appointed under authority of the legislation of Dakota. Yours truly.

CHAS. A. PILLSBURY,

For Chas. A. Pillsbury & Co., and the Pillsbury & Hulbert Elevator Company.

THOMAS JEFFERSON, "MILLER."

Although related by the popular author, Mr. Parton, in his life of our first "Republican" President, it may have escaped the notice of the milling fraternity that in the spirit of the Ancient Guilds of London this man might have been entitled, Thos. Jefferson, "Miller." This large-hearted, hospitable Virginian, from his entrance on the charge of his estate, had furnished his neighbors with their grist-mill facilities. When he became President of the Union, they more than hinted that, with his "large salary," he might now enlarge his mill. The hint was promptly taken, and on the River Rivenna he erected a structure of "rock," four stories in height with four run of stones, with a dam costing a thousand dollars. The mill was completed and eleven thousand bushels of wheat had been stored; coopers, millers and teamsters were in full activity, awaiting the first turn of the great wheel. But, alas! at this moment a storm sprang up among the mountains, and in the midst of a great freshet Mr. Bacon, the manager, saw the whole dam swept away. The President was then at his home in Monticello, and Mr. Bacon hurried up to the mountain top with sorrowing heart, to tell him of the dreadful disaster. "The mill-dam is all swept away," the doleful manager said to the President. "Well, sir," said Mr. Jefferson, with perfect serenity, "we can't make a new dam this summer; but we will get Lewis' ferry-boat and our own, and get the hands from all quarters, and draw up rock enough in place of the dam to answer for the present; next summer I will send to Baltimore and get some ship bolts and make a dam that no freshet can move." Mr. Bacon says, "No matter what happened you never saw his face ruffled." It is interesting to note also in the midst of the deep interest with which the new North-west is now opening its grand wheat producing capacities to the onward tread of thousands of eager workers and vigorous pioneers, that the first exploration of the Missouri to its source in the Rocky Mountains and across them on down the Columbia to the shores of the Pacific, made by Lewis and Clark, were done under the instigation an appointment of this far-sighted and public-spirited man; while the expeditions of Lieut. Z. M. Pike, whose name is crystallized on the lofty Colorado peak, laying open to the American public the Upper Mississippi beyond the Falls of St. Anthony, and noting the sites of the great cities now rising on its banks, was set in motion by the same head and hand. From the day of Capt. John Smith, sailing up the Chickahominy, in search of the South Sea, America had waited 200 years for this exploration inspired by Thomas Jefferson, "Miller," at the opening of the nineteenth century.—*Prairie Farmer.*

IMPROVED RAPID METHOD OF COPYING DRAWINGS, MANUSCRIPTS, ETC.

The common method of copying drawings by contact with the blue process or sensitive silver paper, which reqnires an exposure to the sun of from fifteen minutes to half an hour, seems likely to be superseded to some extent by the introduction of improved gelatine bromide of silver paper.

Gelatine sensitive paper has been difficult to prepare, but by means of recent improvements the manufacturers are now able to furnish it in large sheets uniformly coated, so that its use in various branches of the arts promises to be extensive.

Architects, draughtsmen, engineers, others who wish to make duplicate copies of their drawings are, by the usual processes, obliged to first make a tracing upon transparent linen cloth, so that the light may easily affect the sensitive paper. Much extra time is lost and expense incurred. By means of the gelatine sensitive paper any ordinary thick card-board drawing can be copied in a few seconds, either by diffused daylight or gas or lamp-light. The copy will be an exact reproduction of the original, showing the letters or figures non reversed.

If it is desired to make a copy in the daytime, any dark closet will answer, where all white light is excluded. The tools required are an ordinary photograph printing frame and a red lantern or lamp.

The sensitive gelatine paper is cut to the size required, and laid with the sensitive side upward upon the face of the drawing, and pressed thereon in the usual manner, by springs at the back of the frame, which is then carried to the window and exposed with the glass side outward from two to five seconds to the light, the exposure varying according to the thickness of the drawing. If gas or lamp-light is used at night, from twenty to thirty minutes exposure is sufficient.

The frame is returned to the dark closet; the exposed sheet is removed to a dark box, and other duplicates of the drawing can be made in the same way. It is thus possible to make from ten to twenty copies of one thick drawing in the same time that it usually takes to obtain one copy of a transparent tracing by the ordinary blue process.

The treatment of the exposed sheets is quite simple; all that is necessary is to provide from three to four large pans or a large sink divided into partitions. The development of the exposed sheets can be carried on at night or at any convenient time, but a red light only must be used. The paper is first passed through a dish or pan of water and then immersed in a solution, face upward, composed of eight parts of a saturated solution of oxalate of potash to one part of a saturated solution of sulphate of iron, enough to cover the face of the paper. Both chemicals are easily obtained at a drug store. The latent image soon appears, and a beautiful copy of the drawing is obtained, black where the original was white, with clear white lines to represent the white lines of the drawing. With one solution from six to eight copies can be developed, one right after the other. After development the print is dipped in a dish of clear water for a minute, and finally immersed for three minutes in the final or fixing solution, composed of one part of hyposulphite of soda dissolved in six parts of water. It is then removed to a last dish of water, face downward, soaked for a few minutes, then hung up to dry; when dry it is ready for use. Instead of a drawing, manuscript can be placed in the printing frame and exposed as described. All the water marks or peculiarities of the grain of the paper will be faithfully reproduced. The advantages of this process are self-evident.

Intricate mechanical drawing can be so rapidly copied that working copies can be quickly delivered. By this process original manuscripts, certificates, and documents of every kind can be rapidly copied, every detail being brought out, the original paper serving as the negative, the copy being of the exact size of the original.—*Scientific American.*

The Case Mfg. Co., Columbus, Ohio, have an order from G. Frick, Chillicothe, Ohio, for scalpers, centrifugals, etc.

Berger & Co., Minear, Ill., have ordered 1 break machine and scalper from the Case Mfg. Co., Columbus, Ohio.

Foreman & Sellers, St. Louis, Mo., have ordered 1 No. 1 double purifier from the Case Mfg. Co., Columbus, Ohio, to be put in the mill of Sage & Co., at Beardstown, Ill.

The Case Mfg. Co., Columbus, Ohio, have been awarded the contract of James Biddle, Weston, Ohio, for a full line of break rolls, purifiers, centrifugals, scalpers, etc., etc., for a full gradual reduction mill.

The Case Mfg. Co., Columbus, Ohio, have just received another order from E. P. Rhodes & Co., Bridgeport, Ohio, for their patent automatic feed to be placed on their Allis rolls.

THE CONSCIENTIOUS WORKMAN.

The conscientious workman is a being we all hear of, but seldom meet. The writer has no hesitation in saying that there are, comparatively speaking, few workmen actuated in their calling by any consideration beyond the mere point of dollars and cents. And the writer furthermore begs to observe that, in his opinion, they are not in the least to be blamed for this; because if there are few workmen endued with conscientious feeling regarding their labors, there are still fewer employers inspired with a conscientious feeling regarding their men. What the writer wishes to argue out is the position, whether it pays a workman to be conscientious, if his employer be so or no. The writer thinks it does, and for these reasons: A man who does his work in the same satisfactory and expeditious manner, under all circumstances, is an acquisition, and those who are in authority very soon discover his good qualities; his light may lie hidden under a bushel for a long time, but is sure to shine out at last. Such a man as this, sober, active, discreet, intelligent, who does his work, not because the foreman happens to be looking at him, but from a sense of right and duty, such a man as this will rise in life like going up a ladder. He is in the same position as the man who keeps his arms down in water; he cannot sink if he tries. That is the conscientious workman, and people who, after reading this, resolve to lay in a stock of the commodity, will find it pays them well to use it, and it is like manna to the Israelites, there is always plenty to be had.

The writer is perfectly aware that the average workman has generally grounds for complaint. He will find, however, if he has not discovered it already, that brooding over grievances makes them swell into mountains, and that grumbling does no good either. If the workman has cause for dissatisfaction, let him look his position calmly in the face, see whether it will be to his interest to take active measures in regard to it; if the result seems doubtful let him make up his mind to submit cheerfully to his burden till the time comes when he can kick it away from him. The writer believes this is good wholesome counsel, and will well bear a trial. Let the workman perform his daily duties, domestic and operative, with the same cheerful spirit, doing his duty because it is his duty; striving earnestly to master the craft he is engaged in to its utmost limits, to improve that which he finds in existence, and his lot in life will be no unhappy one; on the contrary, he will find a hope of improvement in his social position will be an unfailing fund of support to him in his calling, and that if he exercises his stock of conscientiousness, the more he disperses of it, the more he will have on hand for future disposal.—*B. & C. Printer and Stationer.*

A MISSOURI ROLLER MILL.

A correspondent of the Saline County *Progress* thus describes the new roller mill at Miami, Mo.: As is pretty generally known, Mr. John Guthrey, the proprietor, made up his mind some six months ago to change from the old to the new system of milling, and after coming to this decision the next important step was to find which (among the many systems advised) was the best to be had. About two months were spent in travel through this and other states looking at the best mills, and corresponding with the best mill builders and furnishers, the result of which was the selection of Huber's system, so well and favorably known in the milling world, and the Stevens' Rolls manufactured by The John T Noye Company, Buffalo, N. Y. Six weeks were then consumed in cleaning out the old mill and in building an additional story to the main building. On the 7th of August, 1883, foreman John S. Miller, of the Dehner Merpel Mill Building Company, of St. Louis, Mo., with a gang of twelve millwrights, commenced work on the new mill. On the 11th of October, 1883, two months and four days from the day they entered the building, the "Miami Roller Mills" made the first flour under the new system. Mr. Chas. Huber, the renowned Hungarian milling engineer was telegraphed of the completion of the mills, and arrived in this city on the 16th inst. The day was spent by him in testing every part and product of the new mill, and in the evening he left, pronouncing the "Miami Roller Mills" a grand success, equal to any and second to none. It would be very interesting to give a description of how the flour is made, through how many different processes it passes before going to the packer, how many different elevators, conveyers, spouts, reels, pulleys, belts, shafts, etc., etc., are in use, but we feel unequal to the task, so we will bring this to a close by a very brief description of the building, and some of the most important machinery in use. The building is of frame with brick basement, and is four stories high. An engine room built of brick adjoins on the northwest side, and a large two-story brick warehouse adjoins on the east side, all covered with fire-proof iron roofing. Commencing with the motive power, we find a new 48 tube boiler 16 feet long and 55 inches in diameter, which furnishes steam for double the power required. The engine is a splendid 80 horse-power which drives a powerful four ton fly wheel, to which is added an immense pulley over which runs a mammoth belt geared directly to another pulley which drives the main shalf running through the basement and on up to the top floor. We find in the basement an endless line of belting, pulleys, etc., together with a large sink with a capacity for 2,000 bushels of grain, also a line of elevators which carry the grain, etc., to different parts of the building. Ascending to the second floor, we find a busy whirl, as all the receiv, ing, shipping, packing and grinding is done here. On one side of the elevator line can be seen three double sets—twelve pairs of Steven's Rolls, which are nicely framed and look like parlor furniture; on the other side are three Cook flour sacks, or barrel packers. Opposite them, ranged along in a row, stand four large burrs, three for grinding middlings, and one for corn. They are covered with neat curbs. Underneath is the substantial hurst frame. In the front part of this floor, directly over this sink, is a track on which runs a large hopper with a pair of scales at one one of the track for weighing wheat; a spout runs through the wall just high enough to empty wheat from a wagon bed. We go up a flight of stairs to the third floor, where we find a forest of spouting, elevators, etc.; a double Case purifier with a Peerless dust collector attached is running on this floor, together with three Silver Creek centrifugal reels and a number of bolting chests, bins and stock hoppers. Passing on up to the fourth floor we come to the grain cleaning and separating machinery. The corn passes through a strong cleaning and fanning apparatus on this floor, and the wheat passes through a Barnard & Leas' Separator and then through a California brush machine and smutter. On this floor can be seen a George T. Smith Middlings Purifier, a Peerless Dust collector, one of Holcomb & Heine's Excelsior Bran Dusters, and a row of bolting chests. The business will be conducted by the "Miami Roller Mills" Company, of which John G. Guthrey is president, Robert Ruxton, superintendent, A. K. Ruxton, secretary, W. R. Ruxton, cashier.

THE MILLS OF MINNEAPOLIS.

The present milling capacity of Minneapolis is shown in the appended table:

Name of mill.	Operated by	1882. Barrels.	1883. Barrels.
WEST SIDE.			
Anchor	C. A. Pillsbury & Co	850	960
Cataract	D. R. Barber & Son	600	600
Columbia	Columbia Mill Co	....	1,000
Crown Roller	Christian Bros & Co	1,600	1,700
Dakota	H. F Brown & Co	200	250
Excelsior	C, A. Pillsbury & Co	...	800
Galaxy	Cahill, Fletcher & Co	800	1,000
Holly	F. S. Hinkle	250	250
Humboldt	Hinkle, Greenleaf & Co	600	775
Minneapolis	Crocker, Fisk & Co	....	600
*Model	R. P. Russell & Co	250	....
National	Citizens' Bank	100	150
*North Star	H. J. G. Crosweli	350	....
Northwestern	Sidle, Fletcher, Holmes Co	1,100	1,300
Palisade	Washburn Mill Co	550	1,500
Pettit	J. A. Christian & Co	1,200	1,300
St. Anthony	Hinkle, Greenleaf & Co	400	450
Standard	D. Morrison & Co	1,200	1,500
Union	G. W. Goodrich & Co	250	310
Washburn A	Washburn, Crosby & Co.	2,700	3,200
Washburn B		800	1,000
Washburn C		1,600	2,000
Zenith	Sidle, Fletcher, Holmes Co	600	600
EAST SIDE.			
Pillsbnry A	C. A. Pillsbury & Co	5,000	5 200
Phœnix	Stamwitz & Schober	250	275
Total capacities		21,250	26,660

*Burned and not rebuilt.

The figures in the above table for 1882 show what the milling capacity of Minneapolis was in September of that year. In the ensuing year the North Star and Model mills, with 600 bbls. capacity, were burned, while the Columbia, Minneapolis and Excelsior mills, with a total capacity of 2,400 bbls., were completed and put in operation. The Palisade mill was thoroughly remodeled, and the capacity increased from 550 to 1,500 bbls. per day. Other less notable increases have been made in the Washburn A and other mills. Another source of increase was from the mills, while really no machinery was added to them, being able to make more flour on the wheat in the fall and winter of 1882-'83 in a given time than ever before thus simply giving them a higher record. Of course it is understood by all that in giving the capacity of a mill, the maximum figures are universally used; but we must say that the amounts opposite the mills as above set down are nearer the real working figures than is usually the case with statements of the kind, it being our aim to get as near the exact truth as is possible.

Flour produced for three fiscal years, ending Sept. 1:

	Bbls.
1880-81	2,900,268
1881-82	2,301,667
1882-83	4,000,463
EXPORTED.	
1878	109,183
1879	442,598
1880	769,442
1881	1,181,322
1881-82	627,686
1882 83	1,760,750

Northwestern Miller.

THINGS WORTH KNOWING.

IMITATION WALNUT.—We have it on good authority, says an exchange, that an excellent stain for giving light colored wood the appearance of black walnut may be made and applied as follows: Take Brunswick black, thin down with turpentine until it is about the right tone and color, and then add about one-twentieth its bulk of varnish. This mixture, it is said, will dry hard and take varnish well.

To remove bolts that have rusted in, without breaking them, the most effectual remedy known is the liberal application of petroleum. Care must be taken that the petroleum reaches the rusted parts, and sometimes must be allowed a chance to penetrate beneath and soften the layer of rust before the attempt to remove the bolt is made. Bolts and stays on which the nuts are fixed with rust are broken off through impatience. In most cases, a small funnel built around a stud or bolt-end on the nut with a little clay, and partly filled with any of the searching petroleum oils, and left for a few hours, will enable the bolt or nut to be removed.

Friction of machinery is one of the most common causes of fire, especially at night. The shaft heats from the center, and the heat may increase and spread after the machinery has stopped. Rats are the most common and dangerous incendiaries, by dragging greasy rags or waste into their nests, where the requisite heat and dampness are constantly present to create combustion, and they are sure to make nests in cold weather near steam pipes. Lighting apparatus, sparks and defective chimneys, are frequently reponsible for destructive conflagrations. Spontaneous combustion of bituminous coal screenings is very common. Electricity generated by belts, steam pipes, steam heating apparatus, and steam feeds in saw mills, are causes of fires.

Iron door and shutters are not the safest in case of large fires; the difficulty consists in their warping when red hot and in that condition bursting from locks and hinges. The most approved doors are double one inch boards, well nailed across each other diagonally and their sides are covered with tinplates. The hinges must reach all the way across the doors and be well fastened. The size of such a door must be two inches larger in every direction than the opening which it is intended to close. Doors constructed on such principles have been known to withstand a fire which would have destroyed the best of iron doors. Tin is preferable to galvanized iron for a covering, because it can be nailed down closely to the wood and thus does not warp in case of fire.

The prayers of little children are very suggestive. A little girl on Long Island, a few nights ago, closed her devotions with these words: "I do thank thee, Lord, for all my blessings, and I'll do as much for you some time."

NEWS.

Burned.—J. C. Williams flour mill, at Auroraville, Wis.

R. C. Poage & Son, Ashland, Ky., have lately started up their mill on the Case system with splendid results.

E. E. Carpenter, Dover, Ohio, will start up his mill in a short time on the Case system of gradual reduction.

M. D. Bennett, of Bennett's mills, Va., will rebuild his mill at that place and increase capacity next spring.

J. P. Tett, Emporium, Pa., is putting in 1 additional centrifugal reel from the Case Mfg. Co., Columbus Ohio.

Royce flouring mills at Fremont, Ohio, was totally destroyed by fire Dec. 19. Loss $15,000. Insurance $11,000.

The flouring mill at Wilkerton, Ont., owned by David Moore & Son, burned Dec. 16. Loss $35,000. Insurance $19,000.

The Case Mfg. Co, Columbus, Ohio, have an additional order from Samuel Sherman, Kingsville, Ohio, for 1 centrifugal reel

The new 500,000 bushel elevator at Duluth, Minn., will load vessels by pipes. It will be finished when navigation opens.

The Case Mfg. Co., Columbus, Ohio, have an order from P. G. Griffin, Gillespieville, Ohio, for break, scalper, rolls, purifiers, etc.

The Case Mfg. Co., Columbus, Ohio, have an additional order from Park & Bison, Sidney, Ill., for 2 pair rolls and 1 centrifugal reel.

The Case Mfg. Co., Columbus, Ohio, have lately received an order from Hardman & Co., Stoutsville Ohio, for 2 centrifugal reels.

The Case Mfg. Co., Columbus, Ohio, have an order from F. Placier, London, Ohio, for centrifugal reel.

Milwaukee flouring mills produced during the year 1883 about 810,000 barrels of wheat flour against 1,346,509 barrels during the year 1883.

Geo. W. Nicewanner, Piqua, Ohio, has his mill completed and is now in operation under the Case system of gradual reduction with splendid results.

The Case Mfg. Co., Columbus, Ohio, have an order from Foreman & Sellers, St. Louis, Mo, for 6 pair rolls with patent automatic feed and 1 double 3 roll break machine.

The Case Mfg. Co., Columbus, Ohio, have just received an order from Adams & Lash, Alma, Neb., for 1 "Little Giant" break machine and scalper; making three separations.

William Mack, Esq., proprietor of the Express Roller Mills at Cornwall, Canada, writes us that business is good and that they are running full time. He has one of the neatest roller mills in the Dominion.

The Case Mfg. Co., Columbus, Ohio, have an order from the Woodstock Iron Co., Anniston, Ala., for 1 "Little Giant" break machine and scalper combined, 2 pair rolls with patent automatic feed and 1 centrifugal reel.

The Case Mfg. Co., Columbus, Ohio, have been awarded the contract of Wike & Perry, Barry, Ill., for a full line of breaks, rolls, purifiers, centrifugals, scalpers, etc., for a full gradual reduction mill on the Case system.

Garrett Renlilin, Elyria, Ohio, who lately remodeled his mill putting in a full line of gradual reduction machinery furnished by the Case Mfg. Co., Columbus, Ohio, has lately started up with the best of results and satisfaction.

Burned, Dec. 13, M. Livingston's new flouring mill at Paducah, Ky. Loss $50,000. Insurance $23,250. It is said that the fire was caused by the spontaneous combustion of flour. The probable cause was flour dust coming in contact with a light.

A telegram from Vienna, Austria, dated Dec. 16, says: A cargo of 100,000 hundred weight of American wheat has been brought by steamer from Hamburg to Laube, in Bohemia. This is the first cargo of American wheat ever imported into Austria.

Josiah Gates & Sons, of Lowell, Mass, have just completed a leather belt 160 feet in length, 54 inches wide, three thicknesses of leather. It took the backs of 200 hides to make this belt, its weight is over a ton, and the cost over $2,000. This belt was for Ex-Gov. C. A. Pillsbury, of Minneapolis, Minn.

The Case Mfg. Co, Columbus, Ohio, report trade as quite brisk with them, and state that they are operating as many men now in mid-winter as formerly. They say the outlook for spring trade was never so flattering with them and that they will be better than ever prepared to meet it. They are now filling the second large order for their rolls for England within the last few weeks, and argue that this is an evidence of the appreciation of their machines abroad.

About ten o'clock in the evening of Dec. 12th, the flouring mill of the Eau Claire Lumber & Flour Co., at Eau Claire, Wis., was discovered to be on fire. The flames spread so rapidly that despite the prompt arrival of the fire department it was unable to subdue them. From the mill the flames spread to the elevator adjoining, consuming everything within reach. Forty tons of flour, 4,000 bushels of wheat and 11,000 bushels of other grain were destroyed. The total loss is $35,000, distributed about equally among the following companies: Ætna, Home, British America, London Assurance, Western Manufacturers' and American. The mill will be rebuilt on a more extensive scale.

A. Fredenhagen, a St. Charles, Ill. miller, shot himself while in bed at 6:30 o'clock in the morning of Dec. 12 with a fatal result. The suicide has created the most intense surprise, and, so far as known, there was no reason for the deed. Fredenhagen was about 40 or 45 years of age, and owned the finest flouring mills in that part of the country. He was a progressive citizen, and since making St. Charles his home, seven or eight years ago had done much to build up the place. Physically, he was a splendid specimen of manhood. Never had he known a day of sickness, and he was the jolliest of the jolly. Finely educated, speaking several languages fluently, he was a superb entertainer and much sought after socially. So far as the public knows the family relations were all right, and Fredenhagen was the last man who would have been suspected of harboring designs against his own life.

The Anchor Milling Co.'s engine is said to be the largest upright one ever seen in this city, and is more specifically described as follows: The engine is of the Harris-Corliss vertical make, stands 33 feet high, measuring from the base, and weighs 112 tons. Its cylinder is 42 inches in diameter, and its stroke 5 feet. The following are the weights of its leading parts: Piston rod, steel, 3 inches in diameter and 8 feet long, 1,505 pounds; crank pin, steel, 12 inches in diameter, 1,155 pounds; crank, wrought iron, 4,730 pounds; cross-head, steel, 975 pounds; pitman, wrought iron, 3,940 pounds; front-head, 5 800 pounds shaft for pulley, wrought iron, 20¼ inches in diameter, 36,600 pounds The engine stands upon a foundation 13 feet deep which contains 31 carloads of large-sized stone. It will be fed by a battery of six steel boilers, and at a moderate speed will develop 1,000 horse-power. The supply pipe is 16 inches and the exhaust pipe 24 inches in diameter. The pulley used in connection with this engine has a diameter of 24 feet 6 inches, a raised face 42 inches wide, and weighs 77,000 pounds.—*St. Louis Miller.*

A MILLER KEEPS HIS PROMISE!—Mr. J. P. Felt, of Emporium, Pa., is the owner and operator of a 200 bbl. Roller Mill. That the mill is a success with which the owner is highly pleased the following incident is in evidence. The mill is on the "Case" system, the entire plant being furnished by the Case Manufacturing Company. Mr. Felt, when ready to buy his machinery, went to Columbus in person to select just what he wanted, and to get the benefit of competent advice in roller milling and the services of a good superintending millwright. When all was completed and Mr. Felt was about to return home he informed the boys in the office that he was the owner of an orange grove in Florida, and that if the machinery he had just bought proved all that had been promised for it and all that he hoped of it, he would send them a box of oranges from his grove at his next picking. The mill was started up in due time and good reports kept coming from it every now and then. Meantime the little promise about the oranges had almost been forgotten, until just before Christmas, sure enough, here came a large box of oranges of the choicest variety with the Christmas compliments of J. P. Felt. The fulfilling of the promise not only proved that the mill was all right but it evinced the kindly spirit of the donor and secures to him all the more closely the fast friendship of the employes of the Case Manufacturing Company's office, any one of whom would work over hours or go out of his way to do him a favor We lose nothing by being a little clever now and then in our business matters as we go along.

Case.:.Manufacturing.:.Co.

Our Purifier is being more highly esteemed every day. Our "BISMARCK" Mill and accompanying machinery for "Gradual Reduction" grows more and more in favor with every new mill we start up. We make special sizes for different capacities, guaranteeing results every time.

If you want a simple machine or a Full Mill, write us.

THE CASE MIDDLINGS PURIFIER!

A—The Fan spout, is reversible and can be made to blow toward either end of Purifier.

The Fan can be placed on top or end of Purifier—when on end it increases the length 39 inches, and diminishes the height 22 inches.

B—Air-valve upper Riddle.

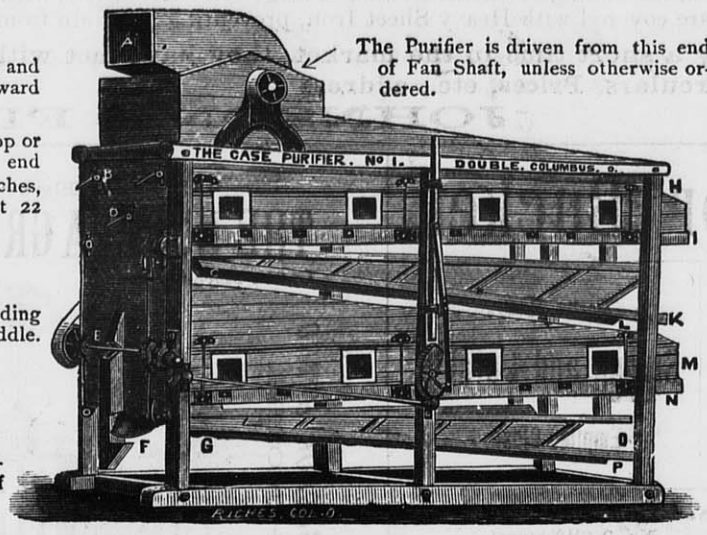
C—Cut-off for upper Riddle, sliding one-half the length of Riddle.

D—Air-valve, lower Riddle.

E—Upper Riddle tails off here.

F—Lower Riddle tails off here.

G—Cut-off for lower Riddle, sliding one-half the length of Riddle.



H—Feed Box for upper Riddle.

I—Bolting Cloth for upper Riddle.

K—Purified Middlings from upper Riddle.

L—Cut-off from upper Riddle.

M—Feed Box for lower Riddle.

N—Bolting Cloth for lower Riddle.

O—Purified Middlings from lower Riddle.

P—Cut-off from lower Riddle.

The upper and lower halves are each a complete machine, and can be run together, or separately, as desired.

THE CASE PURIFIER, MADE DOUBLE OR SINGLE, has the only Patent Automatic Feed in use on any Purifier. Perfect control of the Blast. Runs quiet and noiseless, and is full of points of Convenience and Merit.

[Mention this paper when you write to us.]

The Case Mfg. Co., Columbus, Ohio.

[THE]

Geo. T. Smith Improved Middlings Purifier

The Geo. T. Smith Purifier was the first successful Sieve Purifier ever used in this or any other country. The demand for it has steadily increased from the day the first machine was started.

More than Seven Thousand are Running in the United States Alone.

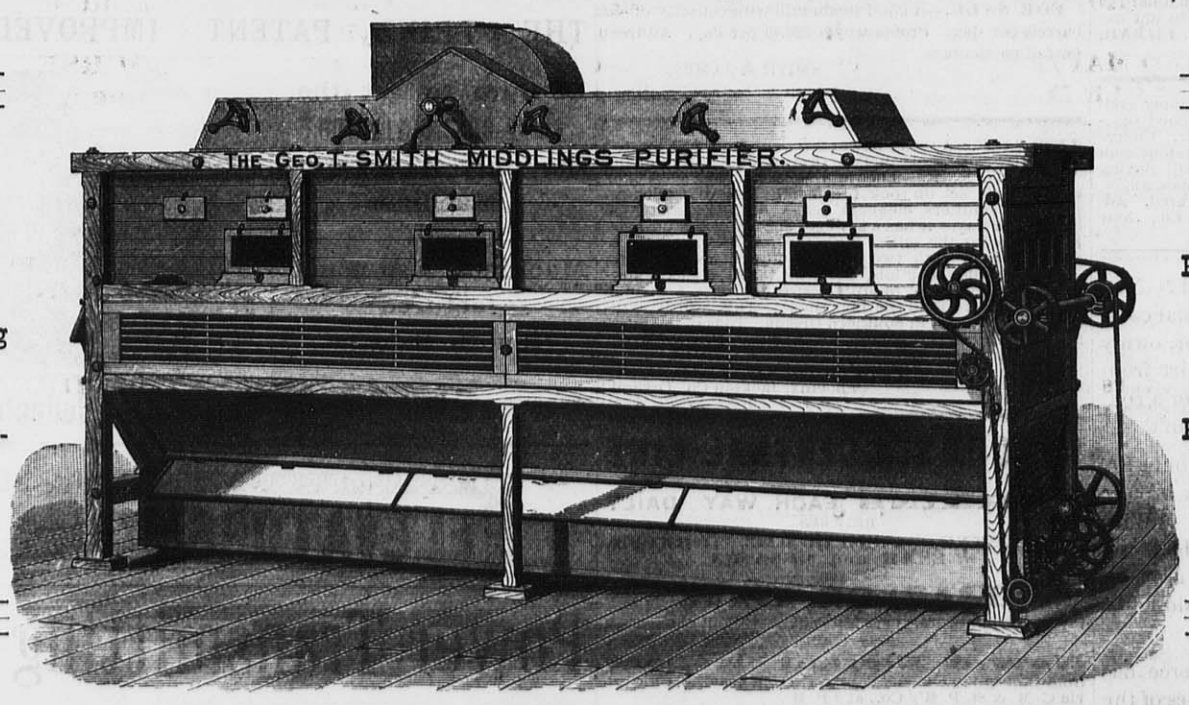
Exclusive Features.

Patent Automatic Brush.

Patent Self-Regulating Feeding Device.

Patent Coil-Spring Eccentric Connection.

EASILY ADJUSTED.



Exclusive Features.

Patented Application of Graded Controllable Air Currents.

Patent Cloth Tightener.

Patent Double Conveyers, in the same Horizontal Plane.

LIGHT RUNNING.

ADAPTED TO ALL SYSTEMS OF MILLING.

FIFTEEN SIZES SUITABLE FOR MILLS OF ALL CAPACITIES.

Single, Double, and Aspirator Machines.

SPECIAL NOTICE.—The Geo. T. Smith Purifier is licensed under all patents owned by the Consolidated Middlings Purifier Co., and under every patent granted in the United States covering any features of value as regards the convenience, economy and efficiency of a Middlings Purifier.

[Please mention the UNITED STATES MILLER when you write to us].

PATENTS

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Combines more good points than any other in the market.

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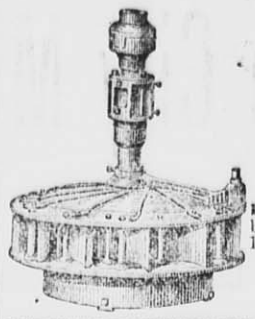

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Fig. 1

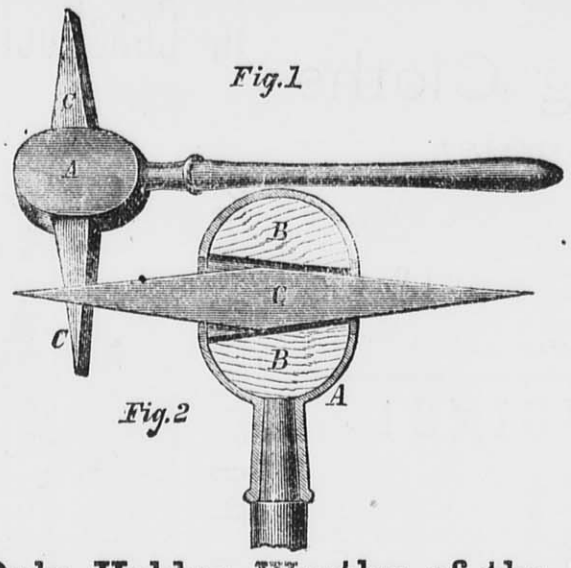

Fig. 2

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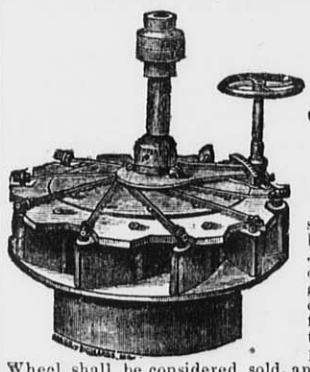

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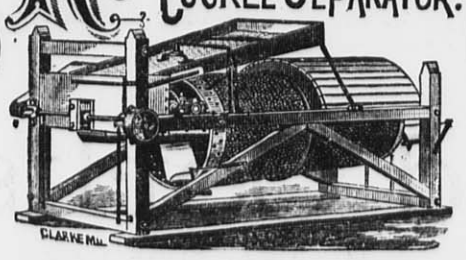

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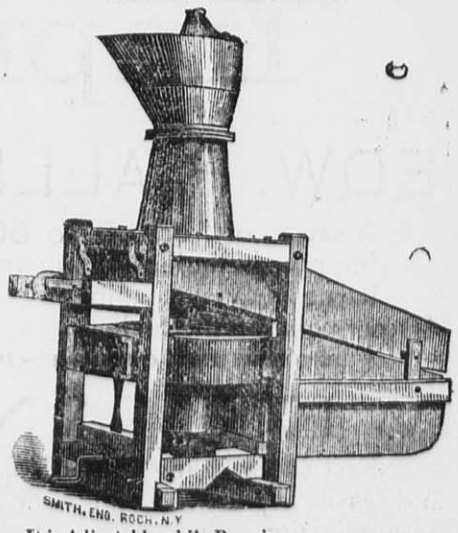

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